



RESEARCH REPORT

Leveraging the Built Environment for Health Equity

Promising Interventions for Small and Medium-Size Cities

Martha Fedorowicz

Joe Schilling

Emily Bramhall

with Brian Bieretz, Yipeng Su, and K. Steven Brown

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Executive Summary

Where you are born affects your health. This is now common knowledge among policymakers and health practitioners. The body of research on the social determinants of health—the social and economic factors that influence health—is extensive. And communities across the US are grappling with how racist policies, a history of segregation, and decades of neighborhood disinvestment have led to poor health outcomes and inequities for communities of color and communities experiencing poverty. Among the social determinants of health are those connected to the built environment. According to the Centers for Disease Control and Prevention, the built environment “includes all of the physical parts of where we live and work” (2011, 1). These include our homes, workplaces, streets, neighborhoods, infrastructure, buildings, parks, trails, and even vacant properties that once contained structures.

Health equity means that “everyone has a fair and just opportunity to be as healthy as possible.”¹ To achieve health equity, communities must address the differing levels of access that various groups have to health-promoting systems and resources like housing, transportation, jobs, parks and recreation facilities, food, medical care, and neighborhoods and their differing levels of quality, cost, and safety. To understand local health inequities, cities can collect data to learn how different groups are disparately affected by health challenges, engage with residents on the barriers they face to accessing health-promoting services and amenities, and evaluate the potential health impacts of programs, projects, policies, and plans.

This research project seeks to identify changes to the built environment that small and medium-size cities can make to promote health and health equity. We focus specifically on small and medium-size cities—that is, cities whose populations are less than 250,000—because compared with the attention that larger cities have received, little research explores how small and medium-size cities are implementing policies, plans, and programs to address the health inequities in their communities. Although we did not set a minimum population for consideration, the average population of the cities in our study was 125,373. Thus, we recognize that many interventions this report recommends are not feasible for or relevant to communities with smaller populations and densities. Alternatively, the recommended interventions may need significant modifications to be appropriate for smaller cities, or those cities may require external support to implement them. Our research focus also explores the interaction and interplay these municipalities have with relevant regional actors and the influence of regional governance and markets on their local interventions to change the built environment and to improve community health.

Based on a literature scan, we identified six built environment domains that are connected to community health and cover common policy and practitioner fields:

1. Safe, healthy, and affordable housing
2. Active living assets and facilities
3. Regional and local infrastructure
4. Food security, health, and nutrition
5. Vacant property reclamation and urban greening
6. Neighborhood and community design

Through our research scan and analysis under each domain, a range of interventions across different dimensions of the built environment emerged that could affect health and health equity. We selected 10 interventions based on three main criteria: whether an intervention has strong or moderate levels of evidence that demonstrates its association with one or more health outcomes, the prevalence of an intervention's use in the field and its ability to be replicated in other places, and an intervention's potential to promote health equity (table ES.1).

TABLE ES.1

Built Environment Interventions Profiled in This Report

Domain	Intervention	Page number
Safe, healthy, and affordable housing	Health-focused strategic code enforcement and proactive rental inspections	25
Safe, healthy, and affordable housing	Home rehabilitation loans	28
Safe, healthy, and affordable housing	Housing trust funds	31
Active living assets and facilities	Equitably funded trails and paths	38
Regional and local infrastructure	Citywide programs to replace all public and private lead-based water infrastructure	40
Food security, health, and nutrition	Farmers' markets and initiatives that place healthy foods in corner stores	43
Vacant property reclamation and urban greening	Vacant lot cleanup and greening	50
Vacant property reclamation and urban greening	Green infrastructure and urban forestry coordination	53
Neighborhood and community design	Complete Streets design principles	57
Neighborhood and community design	Comprehensive zoning code reform for health and equity	60

Our interviews and research on how built environment interventions can lead to positive health outcomes and achieve health equity have revealed 13 promising practices for small and medium-size cities. The first six are focused on how to apply a health equity lens to built environment interventions:

1. Using health impact assessments and community health needs assessments to understand how populations are disproportionately affected by particular health challenges or could be affected by new developments or policies and programs.
2. Engaging people who have experienced systemic racism and neighborhood disinvestment in planning for new interventions, and making sure that the messaging, design, and implementation of interventions are culturally specific to community residents and build on existing community assets.
3. Formalizing how to address equity by examining and modifying internal structures and systems.
4. Training city staff to demonstrate empathy and employ better listening techniques in their interactions with residents.
5. Using people-centered health data and disaggregated data to prioritize communities for additional funding, staff time, and resources.
6. Acknowledging and attempting to mitigate potential adverse effects of built environment interventions.

The final seven practices are focused on how small and medium-size cities can overcome implementation challenges:

1. Joining national networks with peer cities to increase knowledge and information sharing.
2. Establishing regional and local health-focused collaboratives that engage diverse cross-sector health and planning partners to increase municipal capacity, facilitate policy change, and better align work.
3. Partnering with anchor institutions, regional health intermediaries, community development financial institutions, and community foundations so that they can lend their influence and capacity to health equity-promoting projects, including by providing funding and helping with data collection and analysis.

4. Engaging universities, cooperative extensions, nonprofit groups, and research organizations to provide technical assistance and evaluate the impact of interventions.
5. Hiring student interns, AmeriCorps VISTAs, urban fellows, and other “surge capacity” to supplement staff capacity, especially around innovation.
6. Ensuring planning is a strong platform and catalyst for action.
7. Improving policy, plan, and program implementation by closely aligning work with supportive practices and projects.

The interventions featured in this report and the promising approaches that we gleaned from our interviews have the potential to promote positive health and health equity outcomes in cities across the country. But local governments cannot do this work alone—their efforts will have greater reach and more impact if they can engage partners from across sectors and center equity in their implementation.

Introduction

Where you are born affects your health. This is now common knowledge among policymakers and health practitioners. The body of research on the social determinants of health—the social and economic factors that influence health—is extensive. And communities across the US are grappling with how racist policies, discrimination, and a history of segregation have led to a lack of investment in communities of color—particularly Black, Latinx, and Native American communities—and the health inequities these groups experience today. According to the Robert Wood Johnson Foundation, health equity means that “everyone has a fair and just opportunity to be as healthy as possible,”² and health inequities emerge when access to the factors that contribute to positive health is unequal. Research shows that communities of color have less access to healthy neighborhoods and adequate education, employment, and health services than white communities do. The impacts of recent COVID-19 pandemic demonstrate this reality: Black Americans face a higher risk of getting or dying from the disease.³ They are also more financially vulnerable⁴ and more likely to live in higher-poverty neighborhoods—all factors that can limit their ability to pay for needed health treatments and services and their ability to avoid or recover from the disease (Sharkey 2009). Also, several Native American reservations have had higher infection rates than the US population overall. Studies have suggested that higher COVID-19 rates are associated with a lack of access to running water and indoor plumbing among tribal communities.⁵

Among the social determinants of health are those connected to the built environment. According to the Centers for Disease Control and Prevention (CDC), the built environment “includes all of the physical parts of where we live and work” (2011, 1). These include our homes, workplaces, streets, neighborhoods, infrastructure, buildings, parks, trails, and even vacant properties that once contained structures. The built environment can affect health in many ways: for example, homes with poor ventilation can cause high rates of asthma and respiratory diseases among children and adults; a lack of access to fresh, healthy food can cause high rates of obesity and cardiovascular disease; a lack of safe, public spaces to gather can cause depression, isolation, and other mental health challenges; and low-quality stormwater and sewer infrastructure can lead to indoor flooding that can expose families to microbial pathogens and industrial chemicals.

As cities think about how they might promote positive health outcomes and eliminate health inequities in their communities, they must consider inequities in the built environment and understand how they came to be. For example, many cities are trying to figure out how to address the impacts of racist policies, including redlining, the destruction of communities of color for urban renewal projects,

and the siting of factories near communities experiencing poverty and communities of color. In response to this reckoning, many cities acknowledge, or are beginning to acknowledge, that improving outcomes for communities of color and communities experiencing poverty requires a tactical focus on equity and a shift toward antiracist policies and programs. A recent ChangeLab Solutions report on health equity says: “Rather than focusing on reducing the prevalence of any single disease, the challenge is finding ways to change the *distribution* of healthy environments, economic resources, and opportunities. Finding such solutions requires a fundamental shift in how policy is used to promote health” (Calloway and Libman 2019, 8).

To facilitate this work at a citywide level, more municipalities across the country are establishing equity departments (and in the case of county health departments, creating health equity teams), hiring chief equity officers, creating equity assessment toolkits, analyzing internal processes, and crafting plans with equity at the core. To work toward health equity, cities must address the various barriers to positive health: 1) access barriers that arise based on who you are and where you live; 2) cost barriers that prevent access even when services and amenities are available; and 3) built environment barriers that prevent physical access to health because of either quality or location. Although the word “equity” has many applications, it is important to collect data to better understand the inequities within specific communities and to create programs and policies that eliminate them. In this report, we focus on how to improve health equity via the built environment among people experiencing poverty and communities of color.⁶ To do this, we discuss health disparities among people of different races and incomes.

BOX 1

Key Terms and Concepts

We use the following terms and concepts throughout this report.

- **Built environment.** Human-made physical spaces and structures—such as buildings, parks, streets, trails, homes, and infrastructure—where we live and work.
- **Health equity.** When all people have an equal opportunity to be as healthy as possible. Many factors contribute to health equity, including equitable investment in communities—especially in health- and wealth-building amenities, programs, and systems; equitable investment in and creation of health resources and supports for different populations; and equitable access to health and medical services. Poverty, racism, and discrimination are barriers to achieving health equity.
- **Health disparities.** When a group of people experiences a larger share or higher burden of a health challenge relative to another group.

- **Community health.** The collective health of people who live, work, or are active within a defined community. In this context, a community can be based on identity (e.g., transgender people), employment (e.g., day laborers), or location (e.g., southeastern Iowa). Community health complements public health in that it focuses on a specific community's health.
-

This research seeks to identify examples of promising built environment interventions that small and medium-size cities can use to promote health and health equity. We focus on small and medium-size cities—that is, cities whose populations are less than 250,000—because compared with the attention that larger cities have received, little research explores how small and medium-size cities are implementing policies, plans, and programs to address the health inequities in their communities. Although we did not set a minimum population for consideration, the average population of the cities in our study was 125,373, and the average population density was 3,125 people per square mile. Thus, we recognize that many interventions this report recommends are not feasible for or relevant to communities with smaller populations and densities. Alternatively, the recommended interventions may need significant modifications to be appropriate for smaller cities, or those cities may require external support, additional funding, or additional capacity to implement them.

We seek to understand what assets and partnerships these cities employ when improving their built environment and how health and health equity factor in. Although cities were our primary research focus, when they take policy and program actions to change the built environment, they do so within the context of regional governance and markets. And several of the communities that we found through our research and interviews were involved with regional coalitions and networks that fostered collaboration and capacity building across and within these smaller municipalities. In addition to identifying promising built environment interventions, this research seeks to examine evidence gaps because few evaluations of local government interventions and their potential to effectively promote health have been done. Finally, we present practices that can help small and medium-size cities implement and scale proven interventions.

Methods

We began our research by conducting a preliminary scan of the academic and grey literature to identify common policy domains that influence the built environment. Through this scan, we developed an understanding of the interventions that cities can pursue to make changes to the built environment. We

then spoke with 10 people who have professional expertise in health and place, healthy and environmentally friendly infrastructure, urban planning, design, land use, municipal law, and local policymaking. These subject matter experts provided feedback on the identified domains, recommended further reading, and offered recommendations for specific places and interventions across the domains.

Based on the literature and our experiences working with and for local governments, we identified six built environment domains⁷ that both have a connection with community health and cover common policy and practitioner fields:

1. Safe, healthy, and affordable housing
2. Active living assets and facilities
3. Regional and local infrastructure
4. Food security, health, and nutrition
5. Vacant property reclamation and urban greening
6. Neighborhood and community design

Within each of the six domains, we identified a range of local-level interventions from an online search of journal articles, policy reports, and case studies and classified each as a policy, plan, program, practice, or project. Across these five approaches (the 5 Ps, as we call them), the characteristics and qualities of interventions can influence the scale, scope, and focus of the intervention, as well as its implementation. A community, local government, or nonprofit partner would generally combine one or more of these interventions to address health and health equity issues (for an example, see box 2).

After creating a list of interventions within each domain, we reviewed primary source documents to identify the links between the interventions and health outcomes. Through this review, we detailed the level of evidence available for each intervention. **Strong evidence** is evidence from high-quality studies that investigate the connections, and in some cases causality, between the intervention and the outcome where the association or relationship has been found across multiple conditions. Strong evidence methods include randomized controlled trials, quasi-experimental studies, or mixed methods. **Moderate evidence** is qualitative research, most often case studies, that documents and analyzes the intervention's impacts across multiple cities; this could include policy analysis, health impact assessments, and evaluations. We categorize this level of evidence as moderate, rather than strong, because the studies' results cannot be generalized to all the places discussed in this report and beyond.

Weak evidence is promising evidence from a pilot or emerging intervention, often in a policy or practitioner report or article, that is not peer-reviewed and has not been replicated.

While scanning the research, we conducted phone interviews with key stakeholders from small and medium-size cities to better understand what built environment interventions they implement locally and what challenges cities face with implementation. Interviewees met one of three criteria: (1) they were working in a city with an intervention identified in our scan of evidence, (2) they took part in a national or regional health network or learning cohort through organizations such as the National League of Cities or the Robert Wood Johnson Foundation, or (3) they were recommended by the subject matter experts we interviewed and colleagues working in the space. Some interviewees met more than one of the criteria. We interviewed 32 practitioners across four US geographic regions: Northeast, South, Midwest, and West (figure 1 and appendix A). Unfortunately, the number of interviewees we recruited was limited, perhaps because of our time constraints and the pressure that the COVID-19 pandemic created for local officials. As a result, our group of interviewees underrepresents states in the middle of the country.

The practitioners we did interview held positions in a range of organizations that plan and implement built environment interventions at the local level. We conducted 12 interviews with municipal government representatives (most frequently employees of community development and planning departments), three interviews with representatives of health care organizations and health departments, four interviews with representatives of nonprofit organizations focused on health and the built environment, and one interview with a representative of a university cooperative extension. The populations of the interviewees' municipalities ranged from 18,257 to 227,032, and the average population was 125,373. The municipalities also varied in population density.

Finally, to get a better picture of health equity in these cities, we assembled data for the cities where our interviewees were based and an additional 53 "peer" cities across the country and conducted a regression analysis to observe the relationship between demographic and city characteristic explanatory variables and health-related outcome variables. This data and information about our sources can be found in appendixes A and B and in the supplemental data table on the publication page.

FIGURE 1

Municipalities Where Interviewees Were Based



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After our interviews and research review, we narrowed our list of interventions to 10 that we believe could advance health equity and could be widely adopted among small and medium-size cities. We selected these interventions, which come from across the domains, based on

- whether an intervention has strong or moderate levels of evidence that demonstrates its association with one or more health outcomes,
- the prevalence of an intervention's use in the field and its ability to be replicated in other places, and
- an intervention's potential to promote health equity.

The 5 Ps—the Local Policy Ecosystem

Communities can adopt and implement a range of interventions with the potential to improve the health and health equity of their residents, some of which achieve this through changes to a community's built environment. These interventions operate within a broad policy ecosystem of actors,

organizations, and processes. External and internal drivers—such as regional economic conditions, demographics, racial inequities, politics, community dynamics, resources, and capacities—shape the unique context of a community’s policy ecosystem. Local governments are often the focal point because they provide relevant services and manage many of the policy levers—including housing, transportation, and land development—that shape the built environment. Depending on the community, local government capacity, intervention type, and domain, nonprofit intermediaries may lead the intervention or coordinate collective impact initiatives in collaboration with local governments and other stakeholders (e.g., state agencies, community foundations, anchor institutions such as hospitals and universities, businesses, and community-based organizations). Note that our local policy ecosystem is a dynamic system in which these actors interact at crucial stages of the policy process, from policy design through evaluation. Below, we outline five common intervention types within the local policy ecosystem that local governments and their partners can adopt and deploy to change their built environments.

- **Public policies** are formal actions by governing bodies and officials that establish goals, requirements, and regulations—and in some cases resources and funding—to address past, present, or future public problems and/or community needs (Anderson 2006). At the local level, legislative bodies (e.g., city or town councils or county commissions) may enact ordinances (regulations) that are enforceable laws and/or binding policy resolutions or statements.⁸
- **Plans** are a formal expression of local governments’ long-term policy goals and short-term policy priorities and provide their leaders, staff, and communities with a blueprint for immediate and future action (Portney 2013). Communities routinely go through elaborate public engagement processes and conduct detailed data and socioeconomic analyses to adopt a wide array of master plans and comprehensive plans with elements that cover the built environment: transportation, housing, environmental, land use, natural resources, sustainability, public health, food systems, etc. Some states consider these plans legally binding, while others consider them guidance. Plans may also include strategic policy plans or frameworks that may or may not be formally adopted.
- **Programs** detail the local governments’ staffing, resources, and activities designed to implement policies and plans. Many programs are organized and managed by different local agencies, departments, and offices that each follow their own policies and plans. Programs can also be designed, funded, or led by local nonprofit groups, community-based organizations, or other institutions, as well as through public-private partnerships.

- **Projects** are where the local government and its partners transform a policy, plan, or program into “on the ground” action (often in a specific place or space) such as a neighborhood greening project or affordable housing development. Sometimes, projects are pilots or demonstrations that test a new or innovative policy, plan, or program before it is expanded or scaled.
- **Practices** are processes, forums, or tactics that become a customary approach or activity in support of implementing a policy, plan, or program. A practice often evolves from an informal way of organizing and streamlining work into a more formal procedure, included in manuals and guidebooks. In some cases, communities of practice arise when local professionals adapt and adopt similar approaches to addressing policy problems and priorities and then share them with people in other communities who are working on the same issue or problem.

BOX 2

How the 5 Ps Can Connect

Within a policy domain or topic, a community, local government, or nonprofit partner might use a combination of the 5 Ps (public policies, plans, programs, projects, and practices) to address issues of health and health equity.

For example, in determining how to implement its climate action plan, a local government might complete a community planning process that leads to the adoption of an urban forestry master **plan**. By planting and preserving trees, the government intends to improve air quality, provide more green space for residents, and reduce excessive heat caused by the built environment (often known as the urban heat island effect)—all policy goals related to health and the built environment. To implement the master plan, the city funds a new **program** and a new position (urban forester) and enacts a **policy** that requires homeowners and businesses to receive city permit approvals before cutting down trees on their private property. The city and its partners also adopt the following **practices** to implement the plan, program, and policy:

- working with urban greening organizations that can provide outreach, education, and technical assistance to the community and property owners
- creating a guidebook for how landowners can better maintain trees on their property, what types of trees can best adapt to changing climates, and when to seek city permits
- convening a quarterly urban greening working group of the city’s urban forester and midlevel staff from multiple departments (e.g., planning, public works, police, water utilities) to streamline their respective responsibilities under the plan, program, and policy

The Six Built Environment Domains

Research has overwhelmingly demonstrated that the built environment affects community health and can exacerbate health disparities (Calloway and Libman 2019).⁹ Public health researchers and practitioners are now more involved in shaping public policies related to the design, development, location, use, and maintenance of human-made physical spaces and structures such as buildings, parks, and infrastructure.¹⁰ Five of the more common regulatory pathways that affect the built environment are environmental regulations, zoning regulations/land use planning, building and housing codes, and taxing and spending powers (Perdue, Stone, and Gostin 2003). These and other similar policies can reduce the risk that residents will be exposed to toxic places or unhealthy environments or designate spaces within a city that encourage healthier behaviors and lifestyles. At the same time, these policies have been intentionally applied in ways that can cause unhealthy physical environments for Black and Latinx residents and families. For example, communities have applied local land use laws and environmental policies over the years to locate in communities of color disproportionate shares of toxic industrial uses that continue to cause significant health disparities (Manduca and Sampson 2019).

In selecting the six domains to be the focus of our project, we relied on the extensive literature within the public health, urban planning, and public policy fields that documents the relationship between the built environment and public health as well as the common ways that local governments and their partners organize and manage their work. Our domains attempt to capture the primary approaches that local governments and their partners can use to change the built environment. As we discuss later, a few domains may overlap, as communities typically adopt and implement a portfolio of interventions across multiple domains that can have different policy goals.

Safe, Healthy, and Affordable Housing

Few people would dispute the importance of having access to safe and healthy housing, and yet it remains a significant health and equity challenge. In recent years, housing has emerged as one of the most talked about and researched social determinants of health. Several decades of research examining the impact of toxins inside the home on children's health have highlighted the connection between housing quality and health in communities across the US. And in recent years, the focus has broadened to include the impact of other housing characteristics, like affordability, accessibility, and location.

Unsafe housing can affect health in many ways. Hazards such as mold, asbestos, and lead paint and inadequate housing conditions such as pest infestation, crowding, and the presence of toxic chemicals and pollutants are linked to respiratory and infectious diseases, as well as psychological disorders (de Leon and Schilling 2017; Sharfstein and Sandel 1998).¹¹ In the data analysis of our sample of 72 small and medium-size cities, we found that on average, the share of housing stock with potential lead risk was 19 percentage points lower for small rural cities than for center cities, after controlling for race and poverty (see appendix B for more information about this analysis). Homelessness and housing instability (e.g., evictions, foreclosures, and multiple moves in the same year) are also associated with negative health outcomes such as anxiety attacks and depression (Horowski et al. 2012).

A home's location also has implications for health. Proximity to grocery stores, jobs, high-quality parks, and clean transportation options can promote positive health, while proximity to crime, neglected parks, violence, floodplains, pollution-emitting transportation, and factories can be harmful to health (Braveman et al. 2011).

In addition to the physical conditions within and surrounding a home, housing affordability affects health outcomes.¹² An inability to pay rent each month can force families to have high rates of residential mobility. Frequent moves and housing instability have been linked to gaps in health insurance coverage among children (Carroll et al. 2017), not having a usual source of care, postponing needed medical care and medications, increased emergency department usage, and increased hospitalizations (Kushel et al. 2006). Not having enough money to pay rent or being behind on payments can also have negative mental health outcomes. A study by Burgard, Seefeldt, and Zelner (2012) found that people who were behind on their rent or mortgage payments or who were in foreclosure were more likely to meet the criteria for depression, had a higher likelihood of reporting “fair” or “poor” health on self-reported surveys, and were more likely to have had a recent anxiety attack.

The housing challenges listed above affect people of different races and incomes differently. People of color are more likely to live in worse housing conditions (Krieger and Higgins 2002). They are also more likely to live in less desirable neighborhoods with higher environmental health risks because of racist and discriminatory policies such as redlining and predatory mortgage lending (Wallace, Divringi, and Wardrip 2019) and because of where pollution-emitting factories and highways were placed. And they are more likely to live farther from health-promoting amenities like parks, grocery stores, and hospitals (Williams and Collins 2001). People with low incomes who are housing-cost-burdened (meaning that they spend more than 30 percent of their monthly income on housing expenses) often have insufficient funds to cover necessities such as food, utilities, and medical care (Maqbool, Viveiros, and Ault 2015; Schnake-Mahl and Norman 2017). Homeowners with low incomes may also not have the

funds to make health-promoting repairs—such as removing mold and pests or fixing broken fixtures and stairs. According to one study, 42.9 percent of people living below the poverty level had home repair needs, and the average repair cost was \$1,556, which is 5.9 percent of the annual income of a family of four earning 100 percent of the federal poverty level (Wallace, Divringi, and Wardrip 2019).¹³ Native American, Latinx, and Black homeowners and renter households also reported high rates of repair needs (47.7 percent, 39.9 percent, 39.6 percent, and 39.5 percent, respectively).

The built environment interventions designed to address housing challenges are generally focused on three key areas: building accessible and high-quality housing that is safe from environmental hazards and is near health-promoting amenities such as parks, grocery stores, and public transportation options; ensuring affordability; and remediating unsafe housing to prevent illness and injury.

Various organizations work in the housing domain at the federal, state, and local levels. The US Department of Housing and Urban Development (HUD) manages a complex web of federal housing programs, grants, and regulations. Several other federal agencies run companion housing programs. Funding through these programs can go to down payment and mortgage assistance for homebuyers and homeowners, loans for new construction or rehabilitation, project-based rental assistance, tenant-based rental assistance, and temporary shelter programs for people experiencing homelessness.

At the state level, governments distribute federal funds to localities and operate their own housing programs. Forty-seven states, the District of Columbia, and Puerto Rico also have housing trust funds¹⁴ that can deploy funding for low-cost loans, provide credit enhancements for borrowers, and provide funding for other preservation and production activities, although the most common use of these funds is for gap financing for housing development. States, through their housing finance agencies, also distribute federal Low-Income Housing Tax Credits for the development of housing units and float mortgage revenue bonds to fund low-cost mortgages to homeowners and affordable multifamily housing developments (Scallly 2009).

Locally, many actors work in the housing domain. County and city housing departments distribute and oversee state and federal funding and develop local housing plans. Local governments also set regulations for construction, occupancy, habitability, and land use. Many communities also have land banks that convert vacant, abandoned, and tax-delinquent properties for productive use. The Center for Community Progress estimates that the US had about 170 land banks as of January 2018, with most in the Rust Belt states of Michigan, Ohio, and New York.¹⁵ National nonprofit organizations like the Center for Community Progress, Habitat for Humanity, the Center for Community Investment, and the Green and Healthy Homes Initiative and locally based nonprofit housing developers like the Capital

Area Housing Partnership in Lansing, Michigan, and Spokane Housing Ventures in Washington also contribute to local housing remediation and production. Many cities also have their own housing trust funds.

The US also has a complex network of national organizations and regional collaboratives—many with local affiliates and initiatives—that work on housing and health issues. Their work is generally organized around housing preservation, health and housing quality, and affordable housing development.¹⁶

Active Living Assets and Facilities

Creating opportunities for residents to easily and safely exercise and engage in routine physical activity is a powerful way to promote health. When communities are safe and walkable and have appealing amenities, residents are more likely to be active (Frank et al. 2005). Meanwhile, in communities that lack high-quality parks, experience high crime rates, and have unsafe sidewalks, residents can be discouraged from walking, biking, or playing outside (Gordon-Larsen et al. 2006).

Built environment interventions for active living most commonly focus on improving streets so that pedestrian and bicycle travel is safer, including by adding crosswalks, sidewalks, and bike lanes.¹⁷ Other popular interventions include building trails and paths, as well as parks and recreation centers. Infrastructure such as trails, sidewalks, and bike paths can increase a community's walkability and lead to increased physical activity among residents, both for recreation and as a form of transportation. A survey of several studies found that commuting in part or in whole by walking or biking reduced the risk of cardiovascular disease by 11 percent percentage points (Hamer and Chida 2008), and another study found that commuting by walking, biking, or using public transit positively affected social cohesion (Newman and Matan 2012).

Communities do not have equal access to public environments that support active living. Communities experiencing poverty and communities of color have limited access to spaces for safe physical activity (Gordon-Larsen et al. 2006; Powell et al. 2006). Rural populations are also more likely to live farther from green space. Our 72-city data analysis found that on average, the share of the population living within a 10-minute walk of green space is 39 percentage points lower for small rural cities than for center cities, even after controlling for race and poverty. The connection between access to recreational spaces and health outcomes, and the reality that high-quality parks are not equitably distributed in communities, was the motivation for the Trust for Public Land's 10-minute walk

campaign. Its goal is to ensure that residents are within a 10-minute walk to a high-quality park as a way of increasing access to health-promoting public spaces.¹⁸

Additionally, the extent to which community leaders and decisionmakers can effectively promote active living varies across contexts, resources, and strategies (Gordon-Larsen et al. 2006). Even when parks are near communities of color, in particular neighborhoods where a majority of residents are Black, they may be underused because of the presence of and perception of discrimination.¹⁹ The current conversation among researchers and practitioners about active living goes beyond the topic of the accessibility of built environment amenities to the question of whether members of different demographic groups desire certain amenities and feel safe and welcome when they are built.

In local governments, officials across departments hold levers to influence active living through the built environment. Parks and recreation departments typically maintain safe and accessible parks and develop amenities such as playgrounds and trails. Planning departments develop roadway, pedestrian, and bicycle master plans. Transportation departments can influence the accessibility and efficiency of public transit options and may have a role in promoting trails. Public health departments can promote active living infrastructure and transportation options through programming and outreach (Institute of Medicine and National Research Council 2009).

The federal and state governments also influence the active living amenities and infrastructure available to residents. Many state and federal infrastructure and park and trail boundaries intersect with city boundaries. The US Department of Transportation ultimately holds sway over transportation funding. Through the US Department of the Interior, the National Park Service administers the National Recreation Trails program for trails on private, city, county, or state land. The program seeks to develop a national network of trails, and trails designated as National Recreation Trails receive promotion and technical assistance from the federal program.²⁰

Facilitating active living to promote health has been endorsed at the federal level. In 2015, the US Department of Health and Human Services published *Step It Up! The Surgeon General's Call to Action to Promote Walking and Walkable Communities*. It outlines ways for local actors to “design communities that make it safe and easy to walk for people of all ages and abilities” (HHS 2015, 33). National nonprofits such as the clearinghouse Active Living Research also serve as resources in promoting active living. The clearinghouse contributes to evidence-building and research around active living interventions across the country.

Regional and Local Infrastructure

Public infrastructure is the physical systems, facilities, and networks that deliver the services like water, energy, transportation, and internet that most communities require to exist. Our national and local economies, overall quality of life, and communities' short- and long-term environmental quality (clean air, water, and land) depend on effective and efficient infrastructure.²¹ Given infrastructure's prominence in the national economy and the growth of cities, the federal and state governments establish and manage the regulatory foundation for a diffuse, diverse, and complex series of infrastructure systems and facilities. Local governments have crucial "on the ground" roles to play building and maintaining these systems but must operate within this complex federal and state network. Each infrastructure domain (e.g., transportation, energy, or water) has statutes and regulations and myriad federal, state, and regional agencies and authorities, and this setup creates a high level of policy and program fragmentation and specialization. Moreover, the United States has a long history of privatization as federal and state laws empower various quasi-private/public corporations and authorities to manage, build, and maintain infrastructure (Edwards 2017). With the planet facing the threat of global climate change, the infrastructure field continues to reexamine the resilience of its systems (Center for Climate and Energy Solutions 2018).

Several national and professional associations have pointed to old policy models and insufficient government funding as the drivers of a national crisis of infrastructure neglect, decline, and disrepair.²² Degrading infrastructure often causes disparate impacts on communities experiencing poverty and communities of color. Research also shows that the design itself, regardless of the infrastructure's conditions, can increase public health risks that become greater for communities of color.²³ Older infrastructure is often more prevalent in older, industrial "legacy" cities in the Northeast and Midwest. Many of these cities have high concentrations of poverty and a history of racist policies like urban renewal, housing segregation, and credit and resource redlining that destroyed Black neighborhoods or separated them from the urban core.²⁴ Recent research funded by the Robert Wood Johnson Foundation highlights how these multiple infrastructure systems (broadband, energy, water, transportation, etc.) affect public health and equity through a series of policy reports and issues briefs.²⁵ For example, the 2017 water crisis in Flint, Michigan, shone a national spotlight on how aging infrastructure (lead drinking water pipes) can lead to a citywide health crisis that was more serious for families and children in communities of color.²⁶ The lack of access to reliable, consistent, and affordable transportation and broadband internet service in low-income communities and communities of color can also affect public health.

Federal, state, regional, and local governments perform various roles and share responsibilities in the design, development, funding, and maintenance of these different systems. In addition to providing grants and loans to build and maintain infrastructure, federal and state governments have regulatory oversight responsibilities that can result in environmental litigation that compels local governments to make repairs. Local governments, especially small to medium-size cities, have varying levels of involvement with infrastructure depending on the type and the relevant federal and state regulations. Two of the most common sources of concern for local governments, especially smaller cities, are lead in drinking water and the dumping of raw sewage into bodies of water through outdated combined sewer systems. The repair and upgrade of these water infrastructure systems are especially difficult for small cities because the costs require resources well beyond an individual city's bonding capacity and what it can afford through its regular capital improvement plan.

Numerous national, state, and regional organizations work on infrastructure policy, programs, and projects. Among the federal and state agencies are the US Environmental Protection Agency (EPA), the US Department of Transportation, the US Department of Energy, and their state counterparts. Regional energy, water, and stormwater authorities and commissions, along with metropolitan transportation planning organizations, work closely with local governments (large and small) to develop regional infrastructure plans that establish priorities for the development of new projects and the maintenance of existing systems. The demand for repairs often exceeds available resources, so the competition among and across cities for regional resources and funding can be keen. Local governments, especially smaller ones, may have to delay or prolong repairs over decades instead of years. Regional chambers of commerce, alliances of local businesses, nonprofits, and community-based organizations often advocate for infrastructure improvements and resources and in some cases implement small-scale projects. Working with local governments, private and quasi-public utility and infrastructure companies can also design, build, and in some cases maintain different types of infrastructure, such as broadband, toll roads, and stormwater sewer districts. Finally, homeowners and local business owners are crucial players to provide access on their properties for the pipes and wires.

Food Security, Health, and Nutrition

The built environment is relevant to nutrition and food policy in several key ways, including that it affects residents' ability to access nutritious food. Some cities and neighborhoods have more grocery stores and farmers' markets, and healthy food is plentiful. Other places have more corner stores and fast-food restaurants and relatively few places to buy fresh food. Studies show that low-income

communities of color and rural communities of all racial and economic makeups lack grocery stores and that nearby food stores do not have high-quality, healthy food. Also, a 2014 study found that even among communities with similar poverty rates, Black and Latinx communities had fewer large grocery stores and more small corner stores than their white counterparts did.²⁷ And even if grocery stores and farmers' markets have a presence in or are near a neighborhood, issues related to affordability, transportation, and cultural comfort may present more barriers to access. City type is also indicative of access to healthy food. Our 72-city data analysis found that in the cities for which we gathered data, higher shares of the populations of center cities and small rural cities lived more than half a mile from a supermarket, supercenter, or grocery store, compared with suburban city populations.

Places where people are served food such as schools, hospitals, and prisons also play a large role in the relationship between the built environment and food policy, including as institutional buyers. Where and how schools and other institutions buy food can affect both the local farming food supply infrastructure (if they buy local) and the tastes and perceptions of the people they feed.

Land use policy serves a crucial function for food policy. In urban areas, these policies can influence where grocery stores are built and how much land can be set aside for urban agriculture. For suburban and rural cities, land use policy is essential to the preservation of farmland, which is required to increase access to local and organic food. Additionally, some communities are promoting indigenous food production and pushing for public institutions to procure food from these sources.²⁸

Most food policy decisions related to the built environment are made at the local level. For example, local economic development and planning departments decide where new grocery and corner stores can be built, and they can zone land for various uses—including commercial real estate, agricultural purposes, and urban farming—and prohibit certain businesses, like liquor stores and marijuana dispensaries, from operating in certain places. Sometimes local land banks work with municipalities to repurpose blighted or vacant land for urban farming.

National and local nonprofits also play a large role in the domain of food security, health, and nutrition. Local nonprofits run farmers' markets, distribute food to families in need, help build and operate community gardens, and advocate for making healthy food available in convenience stores, vending machines, and corner markets. National nonprofits like ChangeLab Solutions, First Generation Farmers, Feeding America, Food First, HEAL Food Alliance, the National Farm to School Network, and the Center for a Livable Future at Johns Hopkins University provide grants, training, and technical assistance to organizations trying to increase access to healthy food in their communities and advocate for improving food policy and food systems. The Center for a Livable Future also facilitates Food Policy

Networks—a national network of state and local food policy councils that work to improve food systems through public policy.

Finally, in rural communities, university cooperative extension systems provide grants and technical assistance to promote farming initiatives, help communities prepare for and respond to emergencies, protect the environment, and improve food and nutrition safety. Cooperative extensions operate through the nation’s land-grant university system and partner with the US Department of Agriculture’s National Institute of Food and Agriculture.²⁹ In the state of New Hampshire, for example, the University of New Hampshire’s cooperative extension provides training, technical assistance, and small grants to communities across the state in the areas of agriculture and horticulture; home, yard and garden; nutrition and healthy living; and community and economic development.³⁰

Vacant Property Reclamation and Urban Greening

Cities of all types and trajectories confront some level of property vacancy and abandonment. The cumulative impacts of disinvestment (e.g., population and job loss, property decline, crime) in many older, industrial “legacy” cities have led to mounting inventories of vacant and foreclosed upon homes, abandoned buildings, and vacant lots. Racist policies such as urban renewal, redlining, segregation, and exclusionary zoning, among others, made it difficult for property values in Black neighborhoods to stabilize and increase (Rothstein 2017). These structural barriers, coupled with job loss and outmigration/population decline, led to a cycle of disinvestment, high crime, and property abandonment in neighborhoods of color (Hohl et al. 2019). Even neighborhoods with a handful of vacant properties can eventually be consumed by them, often the result of individual decisions by property owners, neighbors, investors, nonprofits, and local government that reinforce one another and catalyze more neighborhood disinvestment and property neglect (Mallach 2018).

Vacant land and abandoned buildings can create public health problems. Empty properties are a primary indicator of neighborhood distress and put the health and safety of area residents and neighbors at risk (de Leon and Schilling 2017). Neighborhoods with persistent blighted properties create a climate of social and psychological disorder that attracts criminal activity and violence and becomes a breeding ground for rats, rodents, and other vectors (Branas et al. 2011). People who live next to vacant properties or in neighborhoods with concentrations of vacant homes, abandoned buildings, and vacant lots are exposed to the traumas associated with vacant properties (e.g., crime) and are more likely to suffer from mental distress (e.g., depression) and transfer that trauma in ways that result in high rates of chronic illness (de Leon and Schilling 2017). Scholars have also highlighted the

breakdown in social capital—crucial to a community’s ability to organize and advocate for itself—that stems from abandoned buildings and vacant lots (Garvin et al. 2013).

Communities deploy a wide array of interventions to address the physical deterioration and associated socioeconomic, public safety, and health hazards created by abandoned buildings and vacant lots. One of the more common strategies involves demolishing vacant homes and abandoned buildings and then stabilizing these and other vacant lots with urban greening treatments.

Under long-standing nuisance abatement powers, local governments can demolish abandoned buildings and homes that pose imminent health and safety hazards and clean up vacant lots strewn with trash, junk, and debris. Demolition is often the only option in cities with weak demand for housing and an oversupply of available existing housing. In response to the mortgage foreclosure crisis and Great Recession of the late 2000s, federal agencies (HUD and the US Treasury Department) gave funding to counties and cities with the most foreclosures to support demolitions from 2010 to 2016. Those funds are almost gone, however, and no new federal money is available for vacant property demolition. Small and medium-size cities must therefore use their own funds or previously allocated ultra-competitive federal or state Community Development Block Grant (CDBG) dollars. In theory, the cities could issue bonds to finance demolition and vacant property reclamation, but few local governments have the fiscal strength to do so.

Leveraging the powers of regional land bank authorities, several cities have launched large-scale demolition programs to reduce supply, stabilize the market and population loss, and adjust their development footprint so it is more consistent with existing and projected population numbers. Land banks have special powers that include property acquisition, site clearance and demolition, and redevelopment. Given their instrumental role in acquiring and demolishing vacant and often tax-foreclosed properties, many land banks manage various vacant lot and urban greening programs (Brown 2015), such as giving vacant lots to adjacent property owners for minimal costs or assembling vacant lots for community gardens and urban farms. In legacy cities, regional land trusts that typically focus on preservation and conservation of open space are beginning to manage vacant lots and convert them for natural land uses.³¹ Land banks and nonprofit community development corporations also partner with residents and neighborhood groups to maintain vacant lots by mowing, weeding, and removing trash.

More communities are now addressing their vacant property challenges through a portfolio of urban greening strategies and tools that seek to revitalize, improve, and enhance a community’s built environment. Urban greening loosely includes the production, preservation, and development of parks,

public green spaces, gardens, natural habitats, and greenways (De Sousa 2014). More than individual sites or strategies, urban greening often encompasses a network of natural and engineering elements that work together to provide ecosystem services or benefits, which can include the socioeconomic, cultural, environmental, and health benefits that people derive from such natural systems (Andersson et al. 2015). Urban greening commonly involves parks, trails, and open space; community gardening and greening (e.g., street landscaping, tree plantings); reclaiming underused, abandoned, or vacant land/lots as neighborhood stabilization strategies; temporary pop-up interventions; business and productive harvesting, such as urban agriculture and urban forests at commercial scale; and green infrastructure (green roofs, low impact development, etc.), with an almost exclusive focus on stormwater management. Each of these categories includes a range of primarily local programs and policies and diverse blends of urban greening strategies and treatments. With so many types of urban greening interventions, what it means to be effective or successful varies. Local context and ecological conditions matter when reviewing research findings and determining how they may or may not apply to other places (Heckert, Schilling, and Carlet 2015).

Although local governments play a crucial role in many of these urban greening interventions, local nonprofit groups and community-based organizations often seem to take the lead in light of financial limitations and staffing capacity constraints in small and even medium-size cities (Eldridge, Burrowes, and Spauster 2019). Within the context of neighborhood revitalization and redevelopment, local community development corporations and environmental nonprofit groups typically receive public and philanthropic resources to reclaim and green vacant lots, plant trees, and install green infrastructure. Some of these local entities are from national organizations that support networks of civic and community leaders and local government officials and staffs. These include the Trust for Public Land, Nature Conservancy, Natural Resources Defense Council, American Planning Association, Groundwork USA, American Society of Landscape Architects, and Center for Community Progress. These networks help facilitate peer learning and the diffusion of innovative policies, plans, and programs.

Neighborhood and Community Design

Various factors related to neighborhood and community design could influence health-related behaviors and outcomes. Prominent built environment features of neighborhood and community design include

- **access to community assets**, including places of employment, businesses, shops, restaurants, entertainment venues, community centers, and other social and commercial infrastructure;

- **physical activity and active mobility options** such as bike routes, parks and open spaces, sidewalks, and good public transit;³²
- **perception of safety** such as low levels of car traffic, good street lighting, and crime preventive infrastructure; and
- **attractiveness** of the neighborhood, including the level of upkeep and tree-lined streets (Handy, Cao, and Mokhtarian 2008).

Neighborhood design characteristics that increase accessibility, options for active transportation and mobility, perceptions of safety, and attractiveness are associated with physical activity and mental health. In a study of neighborhood design features in Northern California, “attractiveness” had the strongest relationship with an increase in physical activity (Handy Cao, and, Mokhtarian 2008). Other studies have shown that compact development near transit has significant health advantages for residents. For communities with denser urban cores, development near transit stations can contribute to increased physical activity and improved health as those commuting by transit engage in more physical activity and walk to destinations near their homes and workplaces than people who do not use transit (Lachapelle et al. 2011). A study in Atlanta found that measures of mixed land-use, residential density, and intersection density in neighborhoods are associated with an increased likelihood that residents will meet the recommended 30 minutes of daily physical activity (Frank et al. 2005). Additionally, the evidence is growing that community design factors such as walkability and transit-oriented developments are connected with increased social capital, connection with neighbors, and mental well-being (Kamruzzaman et al. 2014; Wood, Giles-Corti, and Bulsara 2012).

To promote principles of design for healthy outcomes, local governments can use zoning laws and general planning standards and guidelines to influence core elements such as land use, building placement, density, architectural and landscape design, parking, and street maintenance.³³ Through these factors, neighborhood and community design can influence residents’ physical activity, well-being, and mental health. In this realm, much of the current conversation revolves around urban design principles. Specifically, New Urbanism has emerged as a movement in planning and urban design that emphasizes pedestrian- and transit-oriented neighborhood design and a mix of land uses, such as residential and commercial in the same neighborhood, as a means of creating cohesive and healthy communities where all residents have access to community assets (Fulton 1996). Popular new urban design principles include Complete Streets, which promotes streets that enable “safe, comfortable, and convenient access to community destinations and public places—whether walking, driving, bicycling, or taking public transportation.”³⁴ Additionally, transit-oriented development promotes “compact,

walkable, pedestrian-oriented, mixed-use communities” centered on high-quality transit systems that increase active transportation and decrease reliance on cars.³⁵

Despite the potential for neighborhood and community design features to promote healthy outcomes, they do not benefit all populations equally. Communities experiencing poverty, communities of color, older adults, and people with disabilities may disproportionately suffer from adverse consequences of design, land use, and transportation decisions (Dannenberg et al. 2003). Historically, redlining and restrictive land-use planning segregated cities by race and income and perpetuated disinvestment in specific neighborhoods (Danielson 1976; Rothstein 2017). After this period of disinvestment, the federal government provided funding for cities to destroy “blighted” neighborhoods in the name of urban renewal, a process that displaced hundreds of thousands of families across 600 municipalities, the majority of whom were families of color.³⁶ Rural communities also struggle with walkability. Our 72-city data analysis found that, on average, the Walk Score for neighborhood amenities accessible by walking in small rural communities was 23 percentage points lower than that for center cities.

More recently, health-promoting built environment interventions are less likely to be commonplace among planning documents in low-income communities and communities of color. A study of communities in North Carolina found that counties with lower income levels and higher shares of residents of color were less likely to have attributes that support recreational and transportation-related physical activity in their land use plans (Aytur et al. 2008).

Even when healthy built environment interventions are implemented, residents may still face barriers to using built environment amenities. For example, residents may push back on the implementation of interventions such as Complete Streets policies because they think such policies are not meant to benefit them. In a study of Black and Latinx residents in New Jersey, respondents reported that they would be interested in bike lanes if they were built; however, they named fear of being robbed or assaulted and fear of being profiled by police as barriers to biking (Brown 2016). These concerns are often not mentioned by primarily white and affluent bike advocates during project proposals. To ensure that health-promoting built environment interventions meet the needs, goals, and objectives of all residents, municipal officials must conduct meaningful outreach in the community in which they are implemented.³⁷

At the local level, the neighborhood and community design space has many actors and networks. City departments provide vision and guidance for long-range and comprehensive planning as well as coordination and administration. Planning departments take on various initiatives but largely focus on

neighborhood improvement, housing, economic development, and land use reviews. Additionally, departments of transportation work to provide residents with modes of transportation that are safe, affordable, and efficient.

Many national learning networks, membership organizations, and technical assistance providers work with local leaders and community members to promote healthy neighborhood and community design. For example, the American Planning Association is a professional organization for urban planning professionals. Smart Growth America creates networks and provides technical assistance to state and local elected officials, real estate developers, and investors to promote places that are attractive, vibrant, and prosperous.³⁸ Healthy Places by Design partners with communities to advance community-led action and place-based strategies to ensure health and well-being for residents and to promote an enduring culture of health.

The 10 Interventions

Through our research scan and analysis under the six domains, the following local-level interventions emerged as having positive effects on health and health equity across different dimensions of the built environment. In selecting the interventions, we tried to balance the following three factors:

- whether an intervention has strong or moderate levels of evidence that demonstrates its association with one or more health outcomes
- the prevalence of an intervention's use in the field and its ability to be replicated in other places
- an intervention's potential to promote health equity

Certainly, many other, similar interventions met our criteria within and across each of the six domains, but we felt these 10 provide a good range of interventions that small and medium-size cities could adopt and implement to improve health equity.

Our discussion below is a window into how local stakeholders adapt, adopt, and implement these interventions. For each intervention, we begin by describing what the intervention is, which stakeholders are typically charged with its implementation, and what funding sources it requires. We then present a logic model to demonstrate how the intervention could lead to positive health outcomes. Next, we present the evidence connecting the intervention to health and health equity outcomes. Finally, we turn to its application in small and medium-size cities and feature examples of its use from our interviewees and research, along with implementation insights and strategies. We highlight these examples because we believe they can advance equitable health outcomes and, in some cases, help municipalities overcome implementation challenges common to small and medium-size cities that impede advancement toward equity, such as a lack of political leadership or technical expertise and insufficient funding or community support. In the final section of the report, we identify cross-cutting strategies for navigating around and through these common barriers. Because the COVID-19 pandemic happened during our research project, we did not have enough time to explore in depth its implications for small to medium-size cities' abilities to adopt and implement the interventions discussed in this report. Given this rapidly changing environment, we offer a few preliminary thoughts in box 3 below.

In addition to sharing the interventions, we selected two cities to feature as case studies: Lansing, Michigan, and Tempe, Arizona. We selected these cities because we interviewed multiple stakeholders in each. For the two case study cities, we developed an ecosystem map to illustrate the underlying drivers of their intervention selections, as well as the actors and stakeholders working in these cities to adopt and implement these interventions. The ecosystem map was informed by our interviews and feedback from city stakeholders.

BOX 3

COVID-19 and the Built Environment

The COVID-19 pandemic started while we were conducting research for this report. The policies adopted to treat and mitigate the disease will have health, equity, and socioeconomic impacts that no doubt will reverberate through our domains and policy landscape for years to come.

One overarching question from our analysis is whether a city's size and type will affect the severity of COVID-19's impact on its built environment. In the first few months of 2020, many of the immediate effects on the built environment seemed to occur in dense urban environments. However, outbreaks later happened in small rural cities and townships, particularly those where essential workers in manufacturing or distribution businesses work in close quarters. The impact of the virus on the built environment will vary across regions.

Below, we offer observations on how the pandemic may affect the built environment and the ability of small and medium-size cities to promote health and health equity in the short term. The impact of specific interventions and strategies may vary depending on the domain. Moreover, cities struggling to find funding for some projects because of declining revenues caused by COVID shelter-in-place orders will be forced to make difficult decisions about what to fund and where to fund it.

- COVID-19 has shone a spotlight on historical and ongoing health disparities. Data demonstrate that the disease disproportionately affects low-income Black and Latinx communities.^a These health disparities are a result of past health inequities such as a lack of access to health care and inequitable neighborhood investment. Although these disparities are troubling, many interviewees noted that the national attention they are receiving may help quicken the pace at which health equity as a concept is understood widely and may even help strengthen the case for making health equity-focused built environments a policy priority, especially in the domains of housing, infrastructure, active living, and food security.
- Shelter-in-place policies and the phased reopening of social, economic, and educational activities could profoundly affect active living, regional and local infrastructure, and food-related built environment interventions in the short and long term. The pandemic has also highlighted the lack of recreational amenities available in many low-income communities and communities of color^b and the disparate impacts of the pandemic on people experiencing homelessness. Also, given increases in the use of parks, sidewalks, and public gathering spaces, local governments are experimenting with expanding infrastructure and urban design strategies to meet needs such as for wider sidewalks, more bike paths, and even expanded outdoor dining to comply with social-distancing requirements. All of these will be crucial to maintaining physical and mental health in the future, according to the CDC's COVID-19 guidance.^c
- New behaviors and customs will affect where people work and attend school and how they get to work. If working from home becomes more widespread, cities will face questions about how to manage reductions in the use of underused or perhaps abandoned commercial office spaces.

These phenomena will require municipalities and other stakeholders to rethink the design and implementation of some of the built environment interventions in this report. Also, increases in the time that people spend at home could negatively affect those who have unstable housing situations or live in low-quality housing, as well as children who relied on eating at schools.

- The mass job losses that occurred as a result of stay-at-home orders have made paying rent more difficult for many people. In May, Black, Latinx, and lower-income renters were more likely to miss rent than white and higher-income renters.^d Although some renters were temporarily protected from eviction, those who missed payments must eventually pay or be evicted. Mass evictions would have serious impacts on the built environment, especially as evicted families seek safe places to live.
- State and local government budget shortfalls will adversely affect many of the built environment interventions across the domains we researched.^e Less revenue, driven by a reduction in economic activity and restructuring of economic priorities, means state and local governments will have to cut or reassign staff and program budgets. Although smaller cities outside major metropolitan regions may have fewer COVID-19 cases and impacts, they also have fewer staff. During our interviews, we heard about staff taking on new COVID-19 duties and responsibilities not part of their traditional scope of work. Such reassignments could affect these cities' ability to design and adapt innovative policies, plans, and programs.

^a Kilolo Kijakazi, "COVID-19 Racial Health Disparities Highlight Why We Need to Address Structural Racism," *Urban Wire* (blog), Urban Institute, April 10, 2020, <https://www.urban.org/urban-wire/covid-19-racial-health-disparities-highlight-why-we-need-address-structural-racism>.

^b Kimberly Burrowes, "Is COVID-19 Uncovering Park Inequities?" *Parks and Recreation*, April 23, 2020, <https://www.nrpa.org/parks-recreation-magazine/2020/may/is-covid-19-uncovering-park-inequities/>.

^c "Visiting Parks and Recreational Facilities," Centers for Disease Control and Prevention, last reviewed June 9, 2020, <https://www.cdc.gov/coronavirus/2019-ncov/daily-life-coping/visitors.html>.

^d Solomon Greene and Alanna McCargo, "New Data Suggest COVID-19 Is Widening Housing Disparities by Race and Income," *Urban Wire* (blog), May 29, 2020, <https://www.urban.org/urban-wire/new-data-suggest-covid-19-widening-housing-disparities-race-and-income>.

^e Patrick Sisson, "Amid Protest and Pandemic, Urban Parks Show Their Worth," *CityLab*, June 4, 2020, <https://www.citylab.com/environment/2020/06/public-parks-cities-protests-funding-coronavirus-inequality/612607/>.

Safe, Healthy, and Affordable Housing

1. Health-Focused Strategic Code Enforcement and Proactive Rental Inspections (Practice, Policy)

Health-based strategic code enforcement is a framework that local governments can use to identify housing code violations and prioritize the inspection of violations with health implications (Stacy, Schilling, and Barlow 2018a). Strategic code enforcement principles and practices provide a blueprint for transforming traditional reactive code enforcement programs into proactive operations that can

tailor interventions and activities to different problems and community contexts. More specifically, intake and referral systems can prioritize violations that affect both the immediate safety of residents and the long-term health of residents and their neighbors, with an emphasis on the internal conditions of the apartment or house. Several cities use strategic code enforcement to target vacant properties that can cause neighborhood health challenges like attracting crime and becoming unsafe places where children might seek to play. Proactive rental inspections, which are typically established through a citywide ordinance, ensure that properties are inspected on a regular basis and that landlords deliver safe, habitable properties. They differ from traditional inspections in that they are not complaint-driven. Proactive rental inspections can help identify lead-based paint; mold; broken fixtures; fall and trip hazards, such as broken stairs or railings; and pest problems. In some cities, multifamily rental properties are randomly inspected to ensure that they are up to standard. When combined, health-based strategic code enforcement practices and proactive rental inspections can help remediate unsafe housing (Magavern 2018).

Theory of Change for Health-Focused Strategic Code Enforcement and Proactive Rental Inspections



CONNECTIONS TO HEALTH AND EQUITY

Proactive rental inspections have **strong evidence** connecting them to positive health outcomes. Establishing proactive rental inspections has been shown to increase the number of homes inspected monthly and to help policymakers understand broader neighborhood home-quality trends. A case study looking at the cities of Cleveland; Greensboro, North Carolina; Philadelphia; Rochester, New York; and Toledo, Ohio, found that proactive rental inspection programs led to decreased blood lead levels among children, reduced asthma burden, and in one case a 50 percent reduction in hospital bills.³⁹ Although the evidence that proactive rental inspections affect health outcomes is strong, the evidence that strategic code enforcement does is **moderate** because the number of cities using it is somewhat limited and few evaluations have measured its impact, especially among individuals.

Redlining, urban renewal, and continued disinvestment in Black, Latinx, and Asian communities have resulted in lower homeownership rates, decreased housing value and quality, and increased vacancy rates in these communities (Hester Street 2019). Because communities of color and low-income communities are more likely to be renters⁴⁰ and to live in unsafe housing, proactive rental inspections and strategic code enforcement could address health equity challenges at the individual and neighborhood level (Krieger and Higgins 2002). However, steps should be taken to ensure that code enforcement does not “intentionally or inadvertently target, penalize and displace vulnerable populations, particularly low-income, immigrant and communities of color” and that the burdens of code enforcement—such as reporting, fees, and fines—do not fall disproportionately on these groups (Hester Street 2019, 3). Several studies have documented that renters often do not complain about substandard housing because they fear retaliation from their landlords (Chisholm, Howden-Chapman, and Fougere 2020), and undocumented immigrants may not report out of fear that they will be deported (Local Progress, n.d.). Proactive rental inspections could mitigate these challenges by removing the need for tenants to call about a violation by their landlord. Among homeowners, particularly those with low incomes, repair and maintenance costs are often prohibitive. Additional supports are needed to ensure that they can make repairs that could improve health outcomes and that they are not disproportionately affected by fines and fees if violations are not remediated. Coupling strategic code enforcement with home remediation loans and grants can help ensure that cost-burdened households can make necessary improvements.

PROMISING PRACTICES FOR SMALL AND MEDIUM-SIZE CITIES

Code enforcement is widely used in cities of all sizes to address substandard housing. Strategic code enforcement that prioritizes more serious health-related code violations and proactive rental inspections, however, are less frequently used, likely because of the staffing required to inspect large

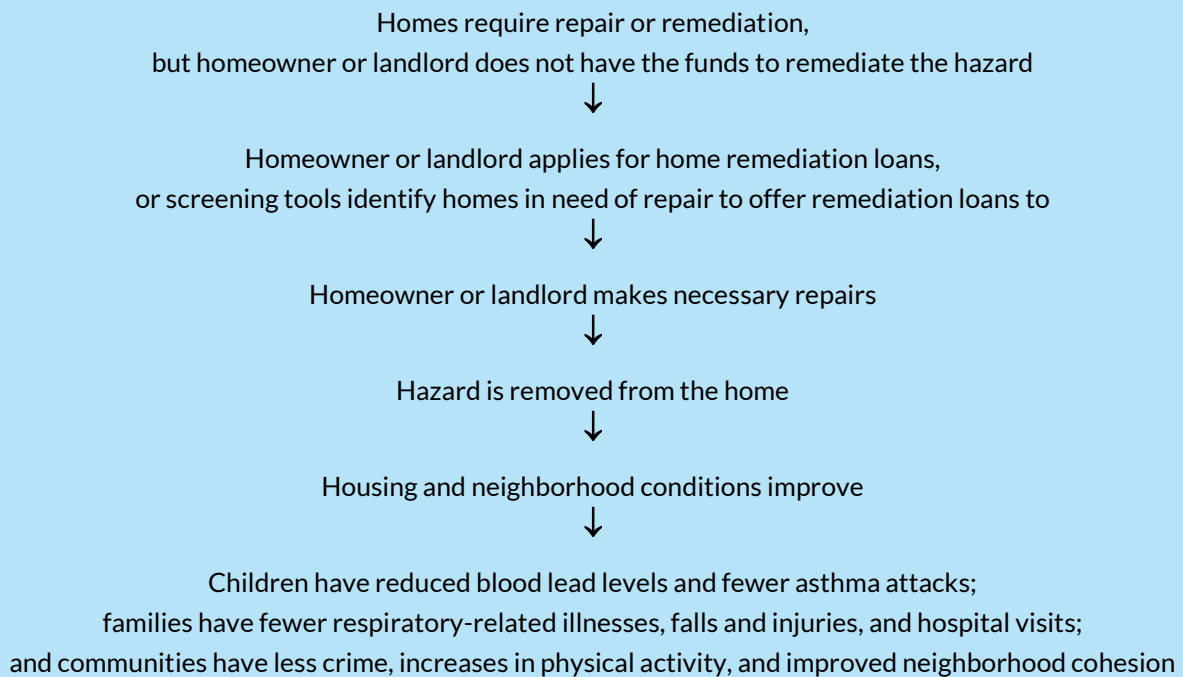
numbers of properties at regular intervals and the poor availability of information about home quality needed to strategically inspect homes. However, in small and medium-size cities, using strategic code enforcement could *minimize* inspectors' workloads while prioritizing the most egregious violations. To focus on health, code enforcement agencies can work with public health experts to update policy manuals to delineate a prioritization system that emphasizes health-related violations and participate in healthy homes inspection trainings (Stacy, Schilling, and Barlow 2018b). Strategic code enforcement also involves shifting organizational cultures and inspector mind-sets from issuing citations and taking owners to court to problem solving that might not require traditional compliance and enforcement approaches.

In **Lansing, Michigan**, the Economic Development and Planning Department is adopting strategic code enforcement practices by training inspectors on how they can incorporate empathy and respect into the code enforcement process. For the first time, the entire department received active listening training in 2019 so they can better understand the challenges residents face in keeping properties up to code and activate a plan based on what they hear. Similarly, in **Rochester, New York**, the code enforcement department recruits staff members who have experience not only in construction and building, but also in customer service. According to a report by Hester Street (2019), in **Newburgh, New York**, the city sends out a code enforcement officer with a social service background in complex cases that might include mental health challenges, child abuse, or other nonbuilding issues. If needed, the officer connects residents to other supportive services.

2. Home Rehabilitation Loans (Program)

Light, moderate, and substantial home rehabilitation loans for substandard properties can help lower the cost of repairs for families who do not have the necessary funds to make them. Most major housing systems need replacement on 10- to 20-year cycles (Turner et al. 2019). Loans can be directed to homeowners with low incomes or to the owners of small rental properties who lack the cash flow to maintain properties. Most loan programs are available for families with incomes below 80 percent of area median income, and many loans are no interest.⁴¹ They can also be directed toward specific types of repairs—for example, lead-based paint remediation. The funding for these programs can come from various public sources, including the CDBG and HOME Investment Partnerships programs, the US Department of Agriculture 504 Home Repair program, HUD's Office of Lead Hazard Control and Healthy Homes, developer fees (such as permitting, linkage, and inspection fees), and state and local housing preservation funds (see intervention No. 3 for more information).

Theory of Change for Home Rehabilitation Loans



CONNECTIONS TO HEALTH AND EQUITY

There is **strong evidence** that providing home rehabilitation loans enables families to make home improvements that result in health benefits.⁴² A report by the Federal Reserve Bank of Philadelphia found that the national aggregate cost of addressing reported housing deficiencies was \$126.9 billion in 2018, with an average repair cost of \$2,920 per household (Divringi et al. 2019). Other studies have shown that low-income homeowners tend to spend less money on home repairs and may be more likely to defer repairs without financial assistance (Herbert and Belsky 2006). Loans enable families to make improvements such as updating energy efficiency features, installing insulation, upgrading heating and ventilation systems, removing lead-based paint, replacing broken electrical outlets and plumbing, and fixing broken stairs and other fall hazards. As with the code enforcement intervention previously discussed, these upgrades have been shown to promote overall physical and mental health; reduce hospital use, absenteeism from school and work, and asthma and other respiratory infections; and improve self-reported well-being (Howden-Chapman et al. 2007; Thomson and Thomas 2015).

Communities of color are more likely than non-Hispanic white communities to report having at least one housing problem. Native American communities in particular are extremely affected by home repair challenges. Data from the 2017 American Housing Survey showed that the percentage of Native

American households with repair needs was 47.7, 7.1 percentage points higher than the share of Black households and 13.6 percentage points higher than the share of non-Hispanic white households (Divringi et al. 2019). The median repair costs for Native American households were about \$1,000 higher than those of other racial groups. Evidence also shows that if funds are directed toward households with low incomes, they can decrease health disparities and disparities in access to quality housing (Jacobs et al. 2014) and help promote neighborhood stability (Smith and Hevener 2011). Programs can also promote equity by being targeted at high-impact groups such as families of children with many asthma-related school absences, older adults, people with disabilities, or frequent users of emergency services. However, in issuing loans, lending entities must consider the ability of borrowers to repay and provide flexible options responsive to the needs of borrowers with very low incomes.

PROMISING PRACTICES FOR SMALL AND MEDIUM-SIZE CITIES

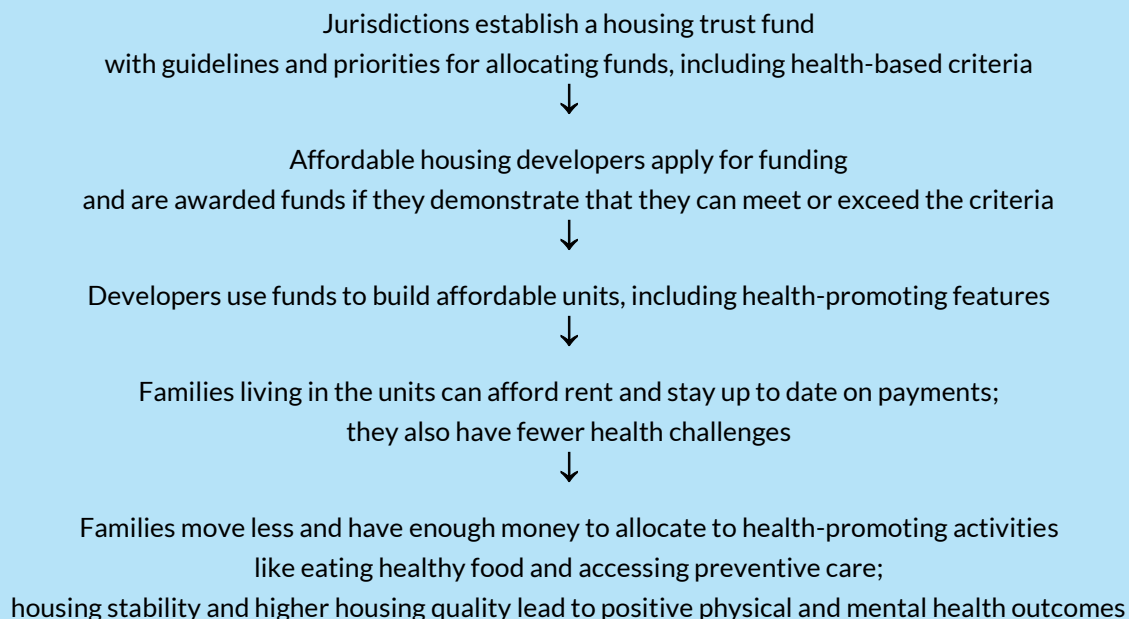
Many cities across the US operate home rehabilitation loan programs. Because of their size and limited funds, however, small and medium-size cities in particular may benefit from partnering with nonprofits and health care providers to conduct health impact assessments, implement healthy home screenings, and establish targeting criteria to ensure that loans reach the people who need them most. In legacy cities in the Northeast and Midwest like Rochester and Buffalo in New York and Kalamazoo and Lansing in Michigan, loans are widely used to update aging homes, which have a higher prevalence of lead-based paint hazards than those in other parts of the country (Jacobs et al. 2002). In cities like Diamond Bar, California, and Tempe, Arizona, where most homes are newer, loans are often used to make adaptive modifications that allow older adults to remain in their homes.

In **Elmira, New York**, the health research organization Common Ground Health conducted a rapid health impact assessment that found that “the highest number of emergency-room visits for respiratory illnesses occurred in neighborhoods with profound levels of poverty.”⁴³ In response, the Chemung County Department of Health began a partnership with the Empire State Poverty Reduction Initiative to conduct lead screening and education in neighborhood hubs. These hubs offer information about home repair programs to help residents remediate lead problems. In **Lewiston and Auburn in Maine; Schenectady, Buffalo, Troy, Syracuse, and Albany in New York; Lansing and Flint in Michigan; and Dubuque in Iowa**, the nonprofit Green and Healthy Homes Initiative helps implement its coordinated-approach model to connect families to healthy home-related services, including rehabilitation loans.⁴⁴ As part of the Green and Healthy Homes Initiative and separate from it, local groups are partnering with hospitals and health systems to establish housing screens that identify patients whose homes are causing frequent hospitalizations. Hospitals generally already hold the data needed to understand who is at greatest risk and are among the primary sources of referrals to healthy home services.

3. Housing Trust Funds (Policy)

Housing trust funds, also known as housing preservation funds, are designed to support the development and preservation of affordable housing. They exist at the federal, state, county, and city levels and can be used to provide gap financing or development subsidies for affordable housing developers, help homebuyers with low incomes access down payment support, acquire properties at risk of losing affordability, provide emergency rental assistance to families at risk of eviction, and fund repairs and weatherization.⁴⁵ Funding for housing trust funds includes dedicated revenue sources like real estate transfer taxes, general appropriations, document recording fees, in lieu fees, bond proceeds, linkage fees, tax increment financing, and demolition fees (Albee, Johnson, and Lubell 2015).⁴⁶ Here, we focus on how housing trust funds can be used for affordable housing production and in turn promote positive health outcomes.

Theory of Change for Housing Trust Funds



CONNECTIONS TO HEALTH AND EQUITY

Although no studies have tracked the direct impact of housing trust funds on health outcomes, many studies connect a lack of access to high-quality, affordable housing to negative health outcomes. For example, frequent moves and housing instability because of an inability to pay rent have been linked to gaps in health insurance coverage among children, not having a usual source of health care, postponing

needed medical care and medications, increased emergency department usage, increased hospitalizations (Carroll et al. 2017; Kushel et al. 2006), and poor mental health (Garshick Kleit, Kang, and Scally 2016). A family's inability to pay rent is associated with poor health among young children, increased use of illicit drugs before age 16, higher levels of behavioral and emotional problems among children, increased teenage pregnancy rates, and adolescent depression (Cutts et al. 2011; Jelleyman and Spencer 2008). Also, families who spend a higher share of their income on housing costs spend less on other needs. This can cause food insecurity and can lead families to reduce expenditures on health-promoting activities such as eating healthy food, exercising, and seeking preventive care (Alexander et al. 2014), as well as to postpone medical or dental care (Harkness and Newman 2005). A recent survey by Enterprise Community Partners found that among severely cost-burdened survey respondents who spent more than 50 percent of their monthly income on rent, 83 percent prioritized paying rent before anything else, compared with 1 percent who prioritized health care costs.⁴⁷ Finally, not having enough money to pay rent or being behind on payments can lead to negative mental health outcomes. A study by Burgard, Seefeldt, and Zelner (2012) found that people who were behind on their rent or mortgage payments or who were in foreclosure were more likely to meet the criteria for depression, had a higher likelihood of reporting "fair" or "poor" health on surveys, and were more likely to have had a recent anxiety attack.

The evidence is **strong** that housing trust funds can increase access to both affordable and high-quality housing⁴⁸ and can reduce disparities because they can be targeted to housing production and preservation for people with low incomes, especially those who just miss qualifying for federal subsidy programs. They can also support Black and Latinx populations in achieving homeownership; both groups have significantly lower homeownership rates than white populations.⁴⁹ However, to ensure that resources are being allocated to communities that need them most, clear guidelines must be set for how communities can receive funding.

PROMISING PRACTICES FOR SMALL AND MEDIUM-SIZE CITIES

Despite the many sources of housing funds for cities, many programs have restrictions. Also, many federal funds, such as CDBG and HOME, have been cut in recent years (Theodos, Stacy, and Ho 2017), and proposals to eliminate those and other federal housing programs altogether have been put forward recently.⁵⁰ Although that has not happened, the need for cities to develop their own flexible housing funds is apparent.

Small and medium-size cities have several ways to prioritize the allocation of housing trust funds to achieve health outcomes. For example, cities can direct funds to preserve the affordability of units

where federal incentives to keep rents low are about to expire. When rents are too high, families are more likely to move frequently, spend a higher proportion of their income on rent and less on other necessities, and miss medical appointments and treatments. Keeping rents affordable may mean preventing these outcomes. In **Tempe, Arizona**, the city conducted an inventory of all housing units within the city as part of its urban core master planning process. This helped the city identify income-restricted housing that was at risk of losing affordability.⁵¹ From there, the city developed 20 housing strategies, including to allocate funds to the city's housing trust fund to achieve the city's affordable housing goals.⁵²

Cities can also develop health-related criteria for the allocation of funds—similar to the way that some qualified action plans do for the distribution of Low-Income Housing Tax Credits (Shi, Baum, and Pollack 2020)—that grantees must include in their proposals before accessing funds or requiring developers to complete a health action plan to receive funds. In Boston, the Metropolitan Area Planning Council, the Massachusetts Department of Public Health, and the Conservation Law Foundation partnered to conduct a health impact assessment of the Conservation Law Foundation and Massachusetts Housing Investment Corporation's Healthy Neighborhoods Equity Fund. The assessment's purpose was to help define the health-related metrics that would be used to determine which housing developments the fund would support (Ito et al. 2013).

In addition to deciding how to spend housing trust funds, many cities are working with partners in the health care field—such as hospitals and insurers—to provide money for the funds. In **Utah**, nonprofit health system Intermountain Healthcare recently partnered with the Utah Nonprofit Housing Corporation, Zions Bank, and the Ivory Foundation to create the Utah Housing Preservation Fund. The fund—which began with a \$20 million investment, \$4 million of which came from the health system—aims to preserve 100 homes for low-income renters.⁵³ In **Columbus, Ohio**, Nationwide Children's Hospital helped create the South Side Renaissance Fund, which will provide long-term funding for the acquisition costs, construction, and permanent financing of up to 170 units of single- and multifamily rental housing that serves families with low incomes.⁵⁴

Lansing, Michigan, Case Study

Lansing is in south-central Michigan. It is the capital of the state and has a population of about 114,000, with a combined statistical area population of 534,684. According to 2018 American Community Survey data, Lansing is 55 percent white, 21 percent Black, 13 percent Hispanic or Latinx, 4 percent Asian, and 7 percent two or more races. In 2018, 26 percent of the population was experiencing poverty, and 9 percent of the population was unemployed; however, the jobless rate is higher among the city's Black and Latinx populations than among its white population. Fifty-one percent of Lansing's residents are homeowners.

Lansing is considered a "legacy city" because of its manufacturing history and has experienced many of the same challenges as other Rust Belt cities, including population declines related to the loss of manufacturing jobs and an abundance of old, blighted homes. In 2015, the City of Lansing was granted \$6 million from the federal Hardest Hit Fund program to eliminate blighted structures. Additionally, Lansing is home to the Grand River floodplain. According to the city, 4,500 people live in and more than 200 businesses are located in the 100-year floodplain.^a

As in many other legacy cities in the Midwest and Northeast, residents experience health challenges related to poor access to healthy foods, low-quality and dilapidated housing, barriers to accessing transportation, a broadband gap, high rates of smoking, the opioid epidemic, and sedentary lifestyles. Just over 35 percent of Lansing residents are obese, and 75 percent of residents live more than half a mile from the nearest supermarket. The city has 35.8 opioid deaths per 100,000 residents per year (more statistics on Lansing are in appendix A).

The following organizations are working to affect the built environment in Lansing:

- The City of Lansing's Emergency Management Division and the departments of Economic Development and Planning, Neighborhoods and Citizen Engagement, Parks and Recreation, and Public Service
- Ingham County Land Bank
- Ingham County Health Department
- Capital Area Transportation Authority
- Michigan State University Extension
- Tri-County Regional Planning Commission

- Nonprofit organizations including NorthWest Initiative, Capital Area Housing Partnership, Allen Neighborhood Center and Farmers' Market, Habitat for Humanity Capital Region, and Middle Grand River Organization of Watersheds
- Lansing Economic Area Partnership

In addition to these formal organizations, the city has a strong network of civic organizations, including neighborhood associations, “Friends Of” parks groups, housing cooperatives, and faith-based organizations that can apply for and receive small-dollar neighborhood grants from the city to do neighborhood beautification and greening projects, among other things.^b

Lansing has received technical assistance from national organizations and has focused many of these resources on improving the built environment for positive health outcomes. The resources include the National League of Cities' Cities of Opportunity pilot^c and the Robert Wood Johnson Foundation's Invest Health program.^d

Lansing also has a strong partner in the Ingham County Health Department. The department facilitates community health improvement plan development, conducts community health assessments, and in 2018 passed a departmental health equity policy to formalize the ways that it would work to promote health equity and social justice.^e It also recently worked to turn a health impact assessment into an online tool that can be used to assess local projects.^f

Our interviewees in Lansing presented some of the city's health policy goals and some—though certainly not all—of the built environment interventions being used to achieve them.

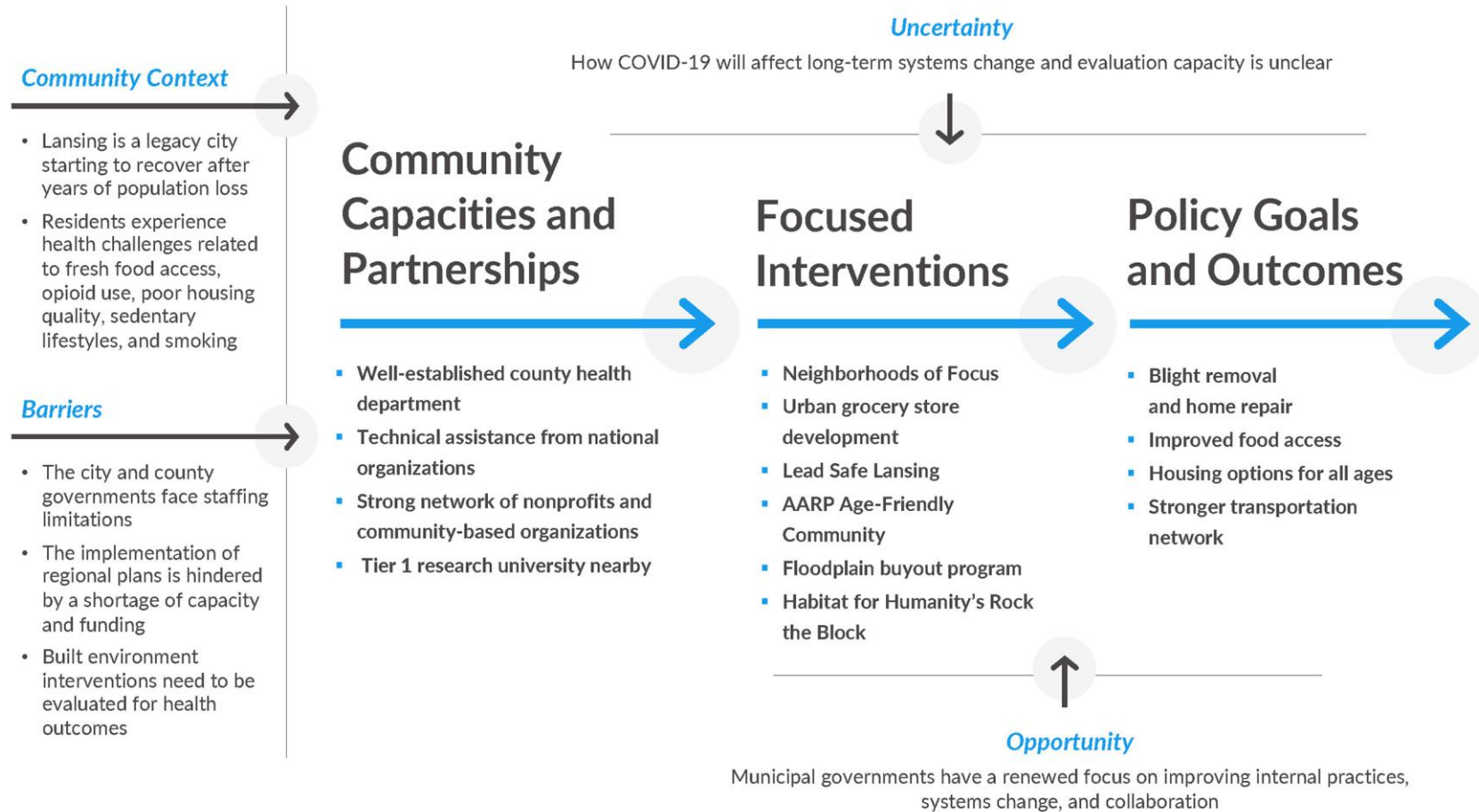
Remove Residential and Commercial Blight and Rehabilitate Substandard Homes

- **Lead Safe Lansing:** This city program provides grants for the remediation of lead-based paint hazards from homes and rental units occupied by children and pregnant women. The program is operated by the city's Development Office and is funded by HUD's Office of Lead Hazard Control and Healthy Homes.

Improve Access to Healthy Food

- **Downtown grocery store development:** A Meijer grocery store is under construction in downtown Lansing. The store will be the only grocery store in the downtown area and will help serve residents who have long been without a nearby grocery store. As part of the site's redevelopment, the developer is accessing brownfield redevelopment funds, tax increment financing, and loans from the state's Department of Environmental, Great Lakes and Energy.^g

Local Built Environment Interventions That Advance Health and Equity in Lansing, Michigan



Create Strong, Healthy, Age-Friendly Neighborhoods

- **Neighborhoods of Focus initiative:** In each of the past three years, the city has selected a neighborhood to prioritize for revitalization efforts. These neighborhoods receive additional focus from city staff, are prioritized when new funding becomes available, and host neighborhood-based collaboratives intent on engaging residents in support of revitalization efforts.^h
- **AARP Age-Friendly Community:** In 2015, Lansing became a member of AARP's Age-Friendly Communities networkⁱ and committed to making Lansing a community where residents can age in place. As part of the initiative, the city is putting together an age-friendly plan for housing, transportation, and infrastructure improvements.
- **Floodplain buyout program:** Since 2008, the city has operated a program to purchase and demolish properties in the 100-year floodplain. The program is funded by the Federal Emergency Management Agency's Hazard Mitigation Grant program, with a 25 percent match from the city.^j

^a "About the Floodplain," City of Lansing, accessed May 27, 2020, <https://www.lansingmi.gov/689/About-the-Floodplain>.

^b "Neighborhood Grants," City of Lansing, accessed May 27, 2020, <https://neighborhoods.lansingmi.gov/562/Neighborhood-Grants>.

^c "New Cities of Opportunity Initiative: Healthy People, Thriving Communities," National League of Cities, accessed May 17, 2020, <https://www.nlc.org/program-initiative/new-cities-of-opportunity-initiative-healthy-people-thriving-communities#:~:text=The%20National%20League%20of%20Cities,Healthy%20People%20and%20Thriving%20Communities>.

^d "We All Have a Stake in People Living Their Best, Healthiest Lives," Invest Health, accessed May 27, 2020, <https://www.investhealth.org/>.

^e "Health Equity and Social Justice," Ingham County, accessed May 27, 2020,

<http://hd.ingham.org/DepartmentalDirectory/CommunityHealth,Planning,andPartnerships/HealthEquityandSocialJustice.aspx>.

^f "HIA Toolkit Overview," Mid-Michigan Mapping and Impact Assessment Toolkit, accessed May 27, 2020, <https://hiatoolkit.weebly.com/about.html>.

^g Kyle Kaminski, "Contractors Prep Downtown Meijer Site," City Pulse, April 2, 2019, <https://www.lansingcitypulse.com/stories/contractors-prep-downtown-meijer-site,12382>.

^h Kyle Kaminski, "Six Takeaways from Lansing Mayor Andy Schor's State of the City," City Pulse, February 5, 2020, <https://www.lansingcitypulse.com/stories/six-takeaways-from-lansing-mayor-andy-schors-state-of-the-city,13819>.

ⁱ "The Member List," AARP, updated April 23, 2020, <https://www.aarp.org/livable-communities/network-age-friendly-communities/info-2014/member-list.html>.

^j "Flood Mitigation," City of Lansing, accessed May 27, 2020, <https://www.lansingmi.gov/702/Flood-Mitigation>.



Lansing River Trail. Photo by Martha Fedorowicz.

Active Living Assets and Facilities

4. Equitably Funded Trails and Paths (Project, Practice)

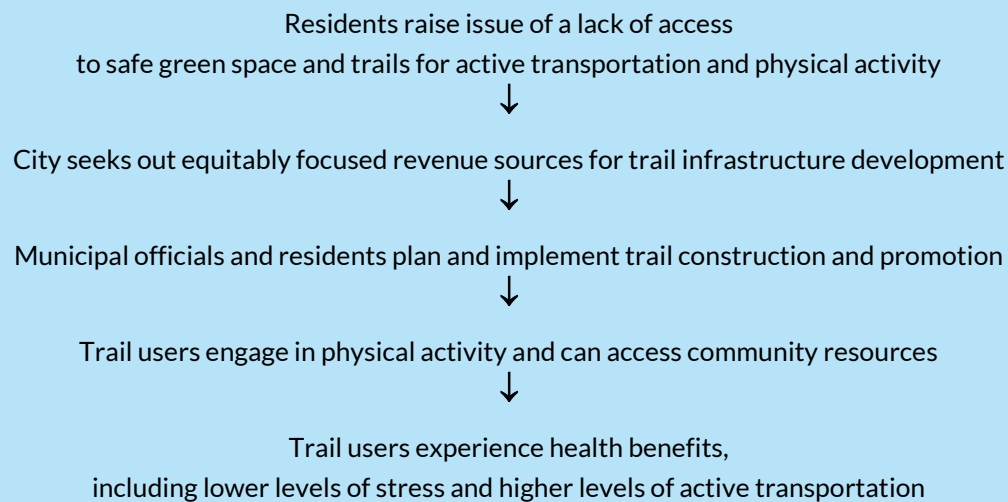
Trails are public paths ideal for walking, running, and bicycling. Comprehensive trail systems give residents access to safe outdoor recreation, the opportunity to enjoy green space, and alternative transportation options such as walking, running, and biking to community assets.

Trail use has benefits for users' health (Powell, Martin, and Chowdhury 2003). Although cities are often aware of these benefits, prioritizing a built environment project such as trail construction in a city budget with little wiggle room can be difficult. Often, cities must be creative and look beyond traditional sources to fund park and trail projects. Given the co-benefits of trails—for health, the environment, and transportation—leveraging partnerships and new sources of funding for trail construction is possible across sectors and stakeholders (McMahon and Benedict 2003).

Some funding sources may risk deepening inequities in park and trail access, however, while others are better designed to address equity considerations (Eldridge, Burrowes, and Spauster 2019). For example, sales taxes can raise funds for parks and trails but are a regressive tax, placing a greater financial burden on consumers with lower incomes. Another, more equity-focused option is to fund

parks and trails through community and economic development programs such as CDBG. Also, trails used for commuting and transportation are eligible for funding under the Better Utilizing Investments to Leverage Development program from the US Department of Transportation.

Theory of Change for Equitably Funded Trails and Paths



CONNECTIONS TO HEALTH AND EQUITY

Trails can connect residents with employment opportunities, businesses, community resources such as parks and libraries, and one another. The evidence that trails contribute to positive health outcomes for users is **moderate**. A survey of users of nine trails in Indiana found improvements in self-reported health outcomes, including higher quality of sleep, less physical pain, and less worry. Of the trail users surveyed, 72 percent listed health-related reasons such as physical activity and stress reduction as their primary motivation for using the trails (Rails-to-Trails Conservancy 2001).

Differences in the use of trails and associated outcomes emerge when residents face barriers to access, as with many built environment interventions. In low-income neighborhoods and communities of color, land use regulations and public investment policies have limited residents' access to park and recreation amenities and opportunities (McKenzie et al. 2013; Wen et al. 2013). Also, the existence of trail and path infrastructure does not guarantee equity in access and usage. Local officials must promote inclusion through intentional programming and features that enhance safety and perceptions of safety (Lackey and Kaczynski 2009). Interviewees working on the Empire State Trail project in New York State observed that trail users were primarily older adults and were more likely to be white and

affluent. To address this pattern, the Empire State Trail steering committee is partnering with nonprofit Common Ground Health to explore barriers to trail use.

Importantly, when local government officials collaborate with communities in the design and implementation processes and in the development of programming, parks and trails are better suited to foster social cohesion and collective ownership of public space, which is essential to developing vibrant, thriving public spaces (Garrett and Stark 2017).

PROMISING PRACTICES FOR SMALL AND MEDIUM-SIZE CITIES

Across interviews, we learned that trails are a common built environment intervention. The interviewees who spoke about their trail initiatives represented a diverse group of places, with varying levels of characteristics such as density (i.e., more urban or more rural) and different political party affiliations (i.e., leaning “blue” or leaning “red”).

Our interviews also revealed that nonprofit groups play a large role in trail development. In **Hawaii County, Hawaii**, the organization PATH developed a 16.7-mile, shared-use, paved path named Queens’ Lei that was designed to accommodate pedestrians, bicyclists, and wheelchair users. The path’s construction and design have been collaborative efforts across organizations and government departments. The Department of Public Works in Hawaii County, in partnership with the West Hawaii Rotary Clubs, led construction, and PATH planted 100 native trees and plants along the trail.

In **Richmond, Virginia**, the Low Line is part of the Virginia Capital Trail, a path that runs along a canal and connects Richmond with the city of Williamsburg. The organization Capital Trees was pivotal in developing the Low Line, which follows an active railroad trestle.⁵⁵ The path’s construction was paired with a horticultural restoration project, and the Low Line receives more than 300,000 visitors a year.

Regional and Local Infrastructure

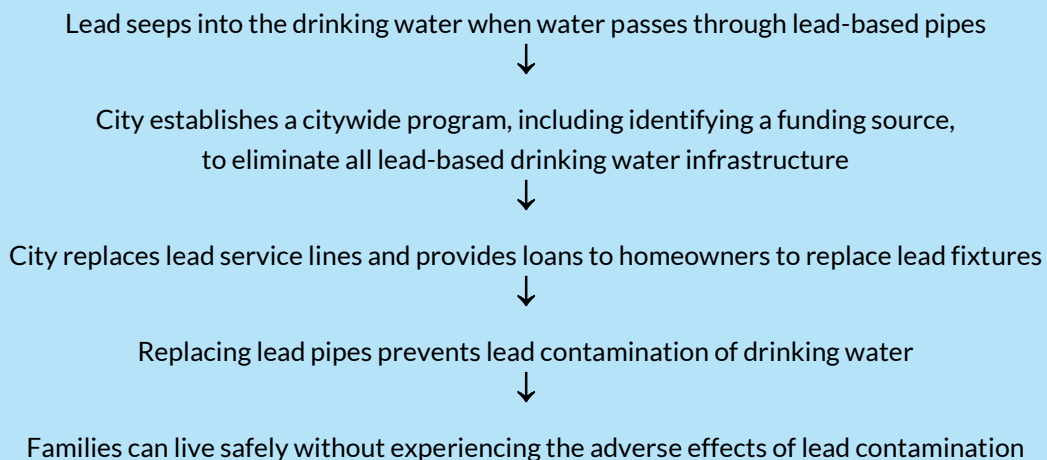
5. Citywide Programs to Replace All Public and Private Lead-Based Water Infrastructure (Plan, Program)

According to the EPA, lead typically enters a community’s drinking water from corroding pipes, faucets, and fixtures that contain lead. Lead service lines, which connect a home’s water pipes with the main line in the street, also contribute. A 2008 EPA report found that 50 to 75 percent of total lead mass, or the

amount of lead in water, came from lead service lines.⁵⁶ These lines are a problem in all communities, but they are particularly dangerous in communities whose water has a high acidity level because acidity can increase corrosion. Also, lead pipes tend to be a greater concern in older cities and homes built before 1986, when the Safe Drinking Water Act prohibited the use of plumbing that contains lead in public water supplies.⁵⁷

Municipal governments typically have jurisdiction over public drinking water infrastructure and work with utilities to change it. To eliminate the risk of lead exposure via drinking water, several cities have implemented citywide programs to remove public lead service lines and to help homeowners remove privately owned drinking water infrastructure that contains lead (pipes, faucets, and fixtures). A primary source of funding for lead pipe removal is the EPA's Drinking Water State Revolving Fund. Through this fund, the EPA has provided states and communities with more than \$21 billion for infrastructure improvements, including replacement of lead service lines and pipes in homes (through loans to homeowners). To receive funds, states must conduct a survey and assessment of their drinking water infrastructure needs and commit to providing a 20 percent match. Once they receive funding, states place the money into a fund that provides loans to local water systems.⁵⁸ Other ways that communities have funded infrastructure upgrades include raising water rates, using foundation funding, selling municipal bonds, and launching capital funding campaigns.⁵⁹

Theory of Change for Citywide Programs to Replace All Public and Private Lead-Based Water Infrastructure



CONNECTIONS TO HEALTH AND EQUITY

The evidence is **strong** that replacing lead pipes in public drinking water infrastructure reduces lead exposure. Lead is a toxic chemical that is harmful even at low levels, and the EPA's maximum allowable amount of lead contamination in drinking water is zero. Lead exposure has particularly harmful effects on children, including lowering IQ; slowing growth; and causing behavioral and learning problems, hyperactivity, hearing problems, and anemia. It can also cause cardiovascular effects, decreased kidney function, and reproductive problems among adults and premature birth and reduced fetal growth rates in pregnant women.⁶⁰ According to the CDC, children younger than 6 are especially at risk from lead exposure.

According to a recent report by the US Water Alliance and DigDeep, 44 million people in the US and Puerto Rico are served by water systems that violate the Safe Drinking Water Act (Roller 2019). More than 9 million lead pipes remain connected to schools, homes, and other locations across the country (Baehler et al. 2020). Although cities have known about these problems for years, the water crisis in Flint, Michigan, which began in 2014, brought the issue to national attention and increased the urgency for cities to respond. Low-income communities of color suffer from the highest rates of lead-based health violations (Vedachalam, Male, and Broaddus 2020). The CDC warns that children living at or below the poverty level and non-Hispanic African American children are at the greatest risk of lead exposure because they live in older housing. Because of these realities, public distrust of water utilities is high, especially among Black and Latinx populations, even when their water quality is similar to that of white populations. Also, to pay for upgrades, some communities are using regressive funding structures—like increasing water rates—that disproportionately place the burden on low-income communities.

PROMISING PRACTICES FOR SMALL AND MEDIUM-SIZE CITIES

Many communities have launched citywide lead pipe removal programs and have successfully replaced or have nearly replaced all lead pipes in their community. Perhaps because of their size, but also because of strong partnerships and public will, several small and medium-size cities have been at the forefront of lead pipe replacement.

The city of **Lansing, Michigan**, replaced all 12,150 of its lead pipes, including all residential service lines leading to homes, by 2016. This effort was funded by water rate increases and cost an estimated \$44.5 million (Center for Neighborhood Technology 2018). According to a case study by the Center for Neighborhood Technology, two state senators (one of whom later became Lansing's mayor) formed a task force with experts from Michigan State University to convince the local utility provider to

accelerate lead pipe replacement. Engineers employed an innovative technique that involved trenchless removal to minimize costs and ground disruption. The city coordinated construction with the Combined Sewer Overflow project to minimize wasting funds.

Another small city, **Green Bay, Wisconsin**, is close to removing all its lead service lines. As of May 2018, Green Bay had fewer than 865 lead service lines, out of a total of more than 35,700 service lines.⁶¹ And in **Kalamazoo, Michigan**, the city has received funding from the Foundation for Excellence, a partnership of the local government and several private donors, to accelerate replacement of lead pipes. Initially, projections indicated that replacing all lead pipes would take the city 87 years. Now, with the help of the philanthropic dollars, Kalamazoo expects to complete replacement in 15 years.⁶²

Food Security, Health, and Nutrition

6. Farmers' Markets and Initiatives That Place Healthy Foods in Corner Stores (Program)

As part of creating a resilient and healthy community food system through built environment programs, municipalities and community organizations can develop farmers' markets and initiatives that place healthy foods in corner stores. (These two interventions are part of a larger food ecosystem that includes urban agriculture, food hubs, and procurement, but those are not discussed in this report.) Farmers' markets and initiatives that place healthy foods in corner stores aim to extend avenues of access to healthy foods. In pursuing these interventions, cities may create a food asset map of fresh food outlets such as grocery stores, healthy corner stores, and farmers' markets. This mapping process can identify inequities in access across a city and inform where farmers' markets and healthy corner stores are placed (Hodgson 2012).

Cities can encourage these interventions by providing funding to healthy food markets and farmers' markets through sources such as CDBGs from HUD and community development financial institution funds from the Treasury Department.⁶³ Cities can also establish zoning laws that specify farmers' markets as an allowed use in certain areas. This eliminates the need to navigate uncertainties and processes such as permitting to start and maintain a market (Wooten and Ackerman 2013). Zoning codes can also create incentives for stores to provide healthier products—for example, by creating a “healthy neighborhood market” category that has fewer permit requirements than a corner store (Michalowski and Scott 2019). Programs that connect local farmers with corner and convenience stores use existing retail infrastructure to increase access to healthy foods and fresh produce.

Theory of Change for Farmers' Markets and Initiatives That Place Healthy Foods in Corner Stores



CONNECTIONS TO HEALTH AND EQUITY

Areas with little access to healthy foods are often described as “food deserts,” while places with an overrepresentation of small stores and fast-food restaurants that serve limited fresh fruits and vegetables and more processed, high-calorie foods are known as “food swamps” and may be more closely associated with obesity than food deserts (Cooksey-Stowers, Schwartz, and Brownell 2017). Undoubtedly, grocery stores are an essential community asset to combat both food deserts and food swamps by providing neighborhoods with food options, including healthy foods. A lack of grocery stores also creates an economic burden on people with low incomes, particularly transit-dependent families (Fang et al. 2013). However, grocery stores also sell unhealthy foods, and trying to increase healthy food consumption and achieve health outcomes via grocery store attraction and construction has had mixed results (Cummins, Flint, and Matthews 2014). For this reason, we focus on farmers’ markets and initiatives that place healthy food in corner stores.

Farmers’ markets can increase access to fresh foods, and there is **moderate evidence** that they lead to positive health outcomes (Sage, McCracken, and Sage 2013). We describe the evidence as moderate because successfully promoting equitable access to healthy foods takes more than setting up a market (Fang et al. 2013; Larson, Story, and Nelson 2009). Issues related to transportation, cultural comfort, affordability and perceived affordability, and acceptance of Supplemental Nutrition Assistance Program and Special Supplemental Nutrition Program for Women, Infants, and Children food benefits may create barriers to consumption of healthy foods (Hutchinson et al. 2012). As such, much of the research in this space focuses on how to better connect community members to farmers’ markets.

Increasing the amount of healthy foods in convenience stores and corner stores is another popular way to address the issue of food swamps. We describe the evidence that this intervention promotes positive health outcomes as **moderate** because relevant studies have had mixed findings. Studies in Baltimore and Hartford, Connecticut, found strong evidence that the intervention promotes positive health outcomes, while one in Nashville did not (Gittlesohn et al. 2010; Larson et al. 2013; Martin et al. 2012).

In implementing either intervention, listening to what residents want and need is crucial. Engaging local organizations with ties to the community helps build community involvement and participation.

PROMISING PRACTICES FOR SMALL AND MEDIUM-SIZE CITIES

Corner stores are often overrepresented in low-income neighborhoods and communities of color (Hilmers, Hilmers, and Dave 2012). Initiatives that place healthy foods in these stores are an opportunity for local government land use and public health departments to leverage partnerships with nonprofit groups, urban agriculture organizations, and local farms. Initially, initiatives that place healthy foods in corner stores may create challenges for store owners if the new products do not sell immediately as customers learn about the offerings and store owners learn what customers like (Gittelsohn et al. 2014). Partnerships and community involvement can help ensure that the intervention is viable and well received.

In **Richmond, Virginia**, the Richmond Healthy Corner Store Initiative works to increase community access to healthy foods. The initiative provides fruits and vegetables to convenience stores in food deserts and is implemented through a partnership between the Richmond City Health District and the nonprofit farm Shalom Farms.⁶⁴ Richmond's upcoming master plan, Richmond 300, includes expanding access to local, healthy food, prioritizing food deserts, and continuing to support healthy foods in corner stores.⁶⁵ One interviewee from the City of Richmond said that even though the healthy corner store initiative is a modest effort (with eight participating stores), it is key to increasing food access because Richmond has a strong history of corner stores.

Tempe, Arizona, Case Study

Tempe is in south-central Arizona and is just east of Phoenix. Tempe has a population of 192,364, with a combined statistical area population of 5,002,221. Tempe is a growing city. Its annual population growth averages between 1.5 and 2.0 percent, with roughly 3,000 new residents per year. According to 2018 American Community Survey data, Tempe is 56.8 percent white, 6.2 percent Black, 22.4 percent Hispanic or Latinx, 8.8 percent Asian, and 2.4 percent Native American. In Tempe, 21.3 percent of the population is experiencing poverty, the unemployment rate is 5.1 percent, and 40.1 percent of residents are homeowners.

In 2017, the Maricopa County public health survey revealed a diverse set of health challenges—including heart disease, stroke, and cancer—perpetuated by a lack of access to the health care system. In Tempe, 26.1 percent of the population is obese, and there are 194.9 deaths from cardiovascular disease per 100,000 residents annually (more statistics on Tempe are in appendix A). Also, because Tempe is home to Arizona State University, the city has a fluctuating and relatively young population, and a large share of its emergency services is dedicated to traumatic injury responses among young people.

The COVID-19 pandemic expedited some of Tempe's health equity work. The Strategic Management and Diversity Office is creating a database and survey for residents to assess the state of health and health disparities. In parallel with this survey, the office will generate a map that overlays city hospitals, clinics, and transit routes and options. This survey and mapping process will allow the city and the community to understand the relationship between health outcomes, the impact of COVID-19, social determinants of health such as socioeconomic status, and factors of the built environment such as proximity to hospitals and access to fresh foods.

An overarching theme in the planned redevelopment in Tempe was the tension between proponents of urban elements and proponents of more suburban development.^a For example, many Tempe residents support affordable housing, but others are reluctant to grow and embrace the housing density that would help produce more affordable options. Interviewees pointed out that generating affordable housing without growth in population and demand is difficult, if not impossible. However, one interviewee pointed out that COVID-19 may shift people's thinking toward more dense and hyperlocal development because stay-at-home orders and decreased travel via public transit have forced them to consider the facilities and resources that are accessible by foot.

Tempe benefits from support from foundations and national networks, including the National League of Cities, the Robert Wood Johnson Foundation, and the Urban Land Institute. These partnerships have allowed Tempe to take on many of the built-environment interventions described below and to increase access to health-promoting interventions through funding and additional capacity. Notably, interviewees

mentioned that while these partnerships and projects offer a lot of opportunity, there is value in continually revisiting how the city governs at a basic level.

City Governance through an Equity Lens

- The city is working on an Equity in Action plan that is facilitated by a coalition of city staff members, residents, social justice leaders, and nonprofit leaders. Through this plan, the city is engaging in conversations to define “equity” generally (and hoping to define “health equity”).^b These efforts will set the stage for future equity-based work. The city is aiming for a proactive, rather than reactive, approach by looking at entire systems.
- The city has \$275,000 set aside for community projects. Community members and neighborhood organizations can apply for funding for capital projects that improve the quality of life in their neighborhoods.^c The proposed projects should meet criteria that include improving the health and safety of residents and have engaged the community throughout the project process. The projects that have received this funding include tree plantings that address urban heat islands, public exercise equipment, and walking paths.

Urban Core Master Plan Promoting Urban Development Principles

- With funding from the Federal Transit Administration, Tempe is undertaking an urban core master plan. Through this plan, the city will rezone the downtown area to promote transit-oriented development, denser development, and other urban-focused design guidelines.
- The urban core master plan will focus on promoting alternative forms of transportation such as bicycles and public transit and decreasing the need for parking and single-occupancy vehicles. Automobile use in Tempe is high, and as a result, the city has traffic challenges. As a part of the urban core rezoning, the city is looking to influence how often residents use their cars for commuting and getting downtown.

Local Built Environment Interventions That Advance Health and Equity in Tempe, Arizona



A Multi-Pronged Affordable Housing Strategy

- Recognizing that affordable housing expansion cannot be achieved through one strategy, Tempe's affordable housing strategy combines 20 policies. Half these policies are designed to promote the city's acquisition of units to create permanently affordable units; the remaining policies provide incentives to developers to build new affordable housing.
- In some ways, vertical governance and resources support Tempe's plan because the city can use federal funding to buy down the cost of development (BAE Urban Economics 2019). In other ways, laws at the state level limit the strategies that the city can use—state preemption prevents Tempe from implementing inclusionary zoning ordinances or tax increment financing.
- Tempe and other partners in Maricopa County will take part in a learning community to study the intersection of health and affordable housing, supported by a grant from the Urban Land Institute's Building Healthy Places initiative.

Sustainability Master Plan

- Through a partnership with the Global Covenant of Mayors for Climate and Energy, Tempe developed its first climate action plan to focus on three areas: energy, transportation, and resistance to extreme heat. Across the three areas, the plan follows the principles of engagement, equity, and evidence.

Supporting Indigenous Food Production

- In pursuing inclusive health outcomes, Tempe is advocating for Indigenous food actors and cultures in Arizona. The surrounding area has a high population of tribal members and large areas of tribal land, and the city is exploring ways to work with and support native communities to build a more equitable and sustainable food system. The indigenous food project would introduce indigenous food and farming methods into the community. Through land trusts, the project would conserve farmland for native crops that are climate-sensitive, resilient, and drought-tolerant.

^a "Urban Core," City of Tempe, accessed July 6, 2020, <https://www.tempe.gov/home/showdocument?id=80159>.

^b "Tempe Innovation Fund," City of Tempe, accessed June 11, 2020, <https://www.tempe.gov/government/strategic-management-and-diversity/strategic-management/tempe-innovation-fund>.

^c "Neighborhood Grant Program," City of Tempe, <https://www.tempe.gov/government/community-development/neighborhood-services/neighborhood-grant-program>.

Vacant Property Reclamation and Urban Greening

7. Vacant Lot Cleanup and Greening (Program, Practice)

Within the urban greening domain, a common and proven intervention is to clean and green vacant lots. Several socioeconomic conditions lead to pervasive property abandonment. In many legacy cities, homes were abandoned after industries left the area or the foreclosure crisis arrived, and the structures were later demolished as part of neighborhood stabilization programs. Other vacant lots are orphan sites, and market dynamics make them difficult to develop, sell, or maintain. Government and quasi-public agencies may also have surplus vacant lots, such as underused streets, alleys, medians, and rights of way. When a private property owner, manager, or agent fails to maintain a vacant lot (often over time), local government can exercise its public nuisance abatement powers that allows city crews or their contractors to enter the property to clean and then stabilize the lot. These nuisance abatement powers apply even if a vacant lot is still under private ownership, although the city must provide sufficient legal notice. Most states enable local governments to bill property owners for the work, and if they fail to pay, the local government can assess the cleanup costs on their property taxes.

Theory of Change for Vacant Lot Cleanup and Greening



CONNECTIONS TO HEALTH AND EQUITY

Within the past 10 years, researchers from the public health, urban planning, criminal justice, and public policy fields have undertaken numerous studies, several with an interdisciplinary lens, to build an expanding body of **strong and moderate evidence** that shows the socioeconomic, health, and ecosystem benefits that come from greening vacant lots (Heckert, Schilling, and Carlet 2015). For example, a study of residents involved with community gardening and green space projects in Philadelphia provides **moderate evidence** that the well-being of residents was improved (Garvin et al. 2013). **Moderate evidence** also supports that these green spaces can reduce stress (South et al. 2015). Participants in land bank greening programs believe they help foster community pride in maintaining their own properties by rebuilding social connections and other indices of social capital (Sadler and Pruett 2017). Numerous studies also offer **strong evidence** that greening vacant lots can lead to reductions in some crimes and increases in perceptions of safety (MacDonald and Branas 2019). These relatively recent studies build on the well-established **strong evidence** from other research that suggests the availability of different types of green spaces of all types can significantly contribute to a person's physical and psychological well-being (Tzoulas et al. 2007).

Low-income residents and Black and Latinx residents are more likely to live in neighborhoods with higher concentrations of property abandonment and vacant lots because of housing, transportation, environment, and land use policies and programs, such as redlining and urban renewal, that uprooted Black neighborhoods and established cycles of public and private disinvestments. A robust vacant lot clean and green program that prioritizes these neighborhoods for intervention could help address racial inequities related to access, use, and quality of green spaces and therefore lead to improvements in health outcomes for residents and their families. For example, a study of the Philadelphia LandCare program (box 4) offers **moderate evidence** that it reduced class- and race-based inequities. More than 45,000 people of diverse racial and ethnic backgrounds and 16,000 households in the city now have access to green space within a half-mile of their residences (Heckert 2013). **Moderate evidence** from studies also illustrates that vacant lot greening could have a positive impact on younger children in low-resourced communities as they tend to depend on recreation and socializing on streetscapes near their homes (Heckert and Kondo 2018).

PROMISING PRACTICES FOR SMALL AND MEDIUM-SIZE CITIES

For small and medium-size cities, the greening of vacant lots remains a relatively low-cost investment that can remedy imminent nuisance conditions and serve as a vehicle for community-led stewardship. Many cities already spend substantial cleanup and law enforcement resources responding over and over again to complaints about nuisance conditions such as illegal dumping and criminal activities on

vacant lots. Not only does cleaning and greening vacant lots address the immediate costs and complaints from repeat properties, but the stabilization and greening strategies, tools, and treatments can also transform these eyesores from liabilities into community assets in neighborhoods that historically have lacked access to green space.

BOX 4

Vacant Lot Greening Program in Philadelphia

Philadelphia LandCare is a vacant lot greening program that is run by the nonprofit Pennsylvania Horticultural Society and has served as the proving ground and national model for hundreds of cities, which have adapted it for their communities. The cornerstone of the Pennsylvania Horticultural Society approach is greening vacant lots with park-like tree and grass plantings and installing modest split rail fences to improve the lots' visible appearance and signal community control.

The LandCare program maintains about 12,000 of the 40,000 vacant parcels in Philadelphia. Initial cleanup costs are around \$1,500 per lot per year, with an additional bimonthly maintenance cost of about \$300.^a Each year, about 2,000 lots are added to the inventory. The city spends \$6.5 million from its general fund annually to support the contract, but studies indicate that each dollar spent reclaiming vacant land yields a direct \$26 rate of return to taxpayers.^b Part of this return on investment comes from indirect savings on medical and work loss costs caused by the reduction in firearms violence.

The Pennsylvania Horticultural Society also runs a workforce development program called Roots to Re-Entry that trains people who are incarcerated in landscape and green infrastructure work as they prepare to transition back to their communities. Although replicating all dimensions of the LandCare model might be a challenge, various aspects can be seen in similar vacant lot greening programs in the Ohio cities of Cleveland, Cincinnati, and Youngstown and the Michigan cities of Detroit and Flint.

^a "Transforming Vacant Land," Pennsylvania Horticultural Society, accessed June 12, 2020, <https://phsonline.org/programs/transforming-vacant-land/program-model-and-impact>.

^b Maggie Loesch, "Greening Vacant Lots: Low Cost, Big Effect in Philly," Shelterforce, November 13, 2018, <https://shelterforce.org/2018/11/13/greening-vacant-lots-low-cost-big-effect-in-philly/>.

A growing number of cities perform block-by-block vacant property inventories, and a few, including Detroit and Cleveland, have robust real property information systems that process the community-led inventories, track data, and analyze vacant property trends (Lind 2016). Among small cities, **Trenton, New Jersey**, partnered with Rutgers University and community development intermediary Isles to conduct its vacant property inventory using neighborhood residents and community organizations to gather the data using handheld tablet and mobile devices (Drake, Ravit, and Lawson 2016).

The initial goal of “cleaning and greening” is to stabilize the vacant lot, but considering the variation in vacant lots across diverse neighborhoods, communities may be best served by having a menu of green ideas and plans for long-term reuse of the lots. For example, under the leadership of Kent State University’s Cleveland Urban Design Collaborative, the Re-Imagining a More Sustainable Cleveland initiative developed a pattern book and resource guide that outlines site specifications, costs, tools, and techniques to convert vacant lots for stormwater management, energy generation, food production, tree farming, and more.⁶⁶ With funding from local philanthropy and the city, Cleveland Neighborhood Progress delivered small grants to neighborhood and community groups to test and adapt several of the vacant lot reuse ideas outlined in the pattern book.⁶⁷

8. Green Infrastructure and Urban Forestry Coordination (Plans and Programs)

Cities are covered with miles of impervious surfaces—buildings, sidewalks, parking lots, roads, and more—that absorb and generate additional heat and cause excessive stormwater to pollute rivers, oceans and streams. Green infrastructure that typically includes multiple landscape treatments and techniques—such as pervious pavers, bioswales, street trees, pocket parks, and rain gardens—can help mitigate these two harmful impacts from the built environment using natural, ecosystem processes. This intervention highlights strategies that small and medium-size cities can use to coordinate and align green infrastructure that mitigates stormwater pollution with urban forest plans and programs that help address the impacts of urban heat islands.

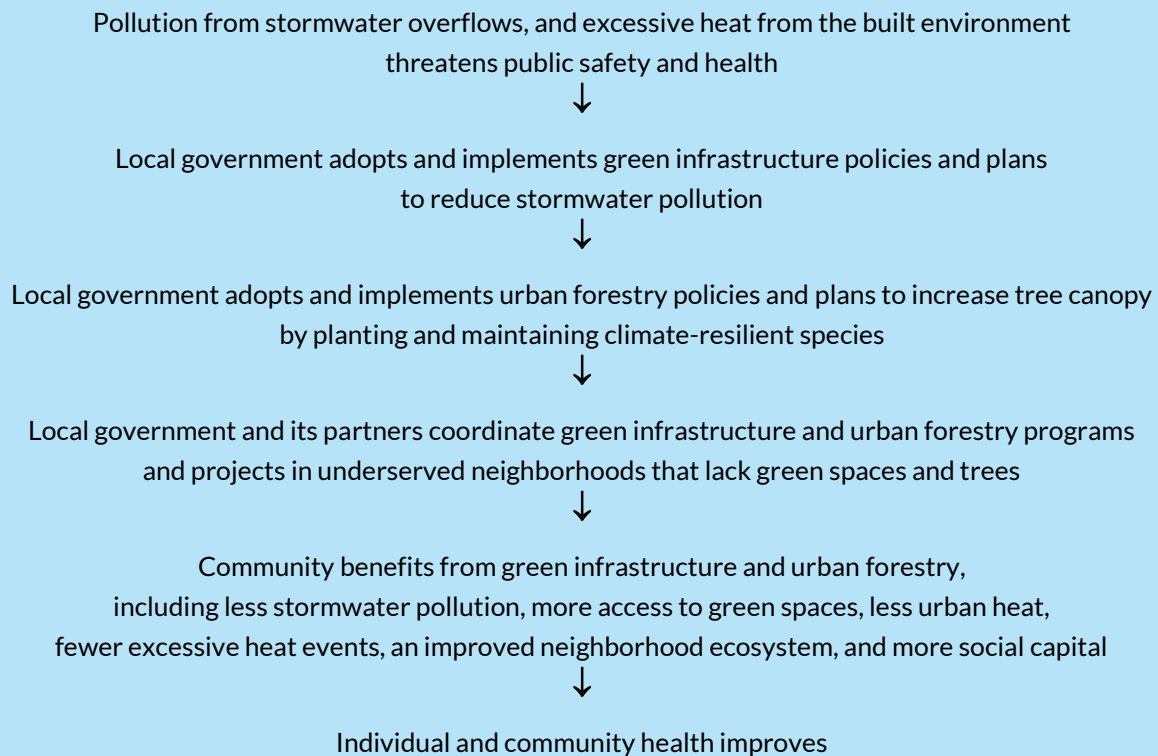
For decades, government-funded infrastructure relied exclusively on building elaborate networks of concrete pipes, culverts, and spillways to control and manage stormwater. About 10 years ago, the EPA began to permit state and local governments to integrate green infrastructure projects and practices into their federally required stormwater management plans as an alternative to the traditional “grey” infrastructure.⁶⁸ Green infrastructure policies, plans, and programs, together with “low impact development” projects and practices,⁶⁹ leverage natural systems to reduce stormwater’s negative impacts on cities and its neighborhoods. For example, these green projects and practices can act like a sponge, soaking up stormwater and reducing the demands on “grey” stormwater infrastructure. This in turn reduces the likelihood of a wastewater overflow, which can pollute drinking water or infiltrate people’s homes. Also, heavy stormwater episodes can flush pollutants (heavy metals, sediments, and nutrients) into local and regional bodies of water, diminishing water quality.⁷⁰

Although cities and towns have typically taken care of trees within their parks and those lining their streets, within the past 10 years, urban forestry has become a recognized local government program

that conserves trees and tree canopies as natural ecosystems to help sustain clean air and water by reducing stormwater runoff, cooling the urban heat island, reducing air pollution, and providing wildlife habitat. This approach can be beneficial for the US communities experiencing extreme storms and intense heat weather events as a result of climate change.⁷¹ Communities can also address the ecological impacts from development and the built environment by capitalizing on the urban forest's natural capacity to mitigate environmental impacts while providing social and health benefits for people, as well as economic benefits for communities (American Planning Association 2009).

Local governments are leading the way by adopting green infrastructure and urban forestry policies, plans, and programs that result in innovative projects, practices, treatments, and techniques for managing stormwater and reducing urban heat island impacts. Although dozens of cities, many small and medium-size, have formally adopted green infrastructure and/or urban forestry master plans, the implementation challenge is how best to coordinate these two elements so a community can leverage the ecosystem benefits from each. Local governments often have one office or division manage stormwater (e.g., public works) while another manages urban forestry. As part of the process to develop forest and green infrastructure master plans, local governments and their partners complete extensive inventories and ecosystem analyses of environmental and ecosystem conditions (hydrology, tree canopy, etc.). Many local governments, especially smaller municipalities, partner with local universities and nonprofit environmental organizations in developing their plans. Within this space, federal agencies such as the US Forest Service⁷² partner with national environmental and natural resources groups to provide technical assistance and guidance to municipalities.⁷³ The greening of vacant lots is another strategy for controlling stormwater and expanding the urban tree canopy.⁷⁴

Theory of Change for Green Infrastructure and Urban Forestry Coordination



CONNECTIONS TO HEALTH AND EQUITY

Many vulnerable populations in cities suffer from substantial deficits when it comes to the health, ecosystem, and community benefits that flow from green infrastructure and urban forests. **Strong evidence** suggests that Black and Latinx neighborhoods with low income residents and renters have dramatically less coverage from trees located adjacent to sidewalks and other public rights of way. These findings have important implications for local public investment and policy strategies (Landry and Chakraborty 2009). According to the CDC, urban heat exposure remains the cause of the most weather-related deaths in the US.⁷⁵ And residents who have low incomes and live in substandard housing are more likely to experience heat-related illnesses and even death. Research also documents that Black and Latinx residents are more likely to live in substandard housing (with, for example, a lack of functional air conditioning and ventilation) and in neighborhoods with fewer trees and green spaces.

Putting policies and plans in place that can increase green infrastructure and urban forests can help improve the health and safety of a city's most vulnerable communities. Emerging **moderate evidence** documents that properly selected and planted trees can reduce outside surface temperatures as much

as 20 to 40 percent (EPA 2008). Moderate evidence also shows that greater tree canopy cover is associated with lower rates of violent and property crime. For example, in New Haven, Connecticut, a 10 percent increase in tree canopy was associated with a 15 percent decrease in violent crime and a 14 percent decrease in property crime, regardless of socioeconomic factors.⁷⁶ Researchers hypothesize that trees reduce aggression that can lead to crime. On the ecosystem front, **strong evidence** supports the proposition that increasing green infrastructure on vacant lots can reduce the risk of flooding in communities more prone to floods from extreme wet weather events (Newman et al. 2018).

By integrating urban forests with green infrastructure, cities can leverage and expand the ecosystem benefits for neighborhoods and their residents (USDA 2020). Researchers are exploring the development of a tool that can inventory, measure, and assess green infrastructure—a type of equity index—that can help promote equitable planning (Heckert and Rosan 2016).

PROMISING PRACTICES FOR SMALL AND MEDIUM-SIZE CITIES

The sustainability office for the City of **Richmond, Virginia**, partnered with community-based organizations, Virginia Commonwealth University, and the Science Museum of Virginia to conduct a citywide urban heat island inventory.⁷⁷ Citizen scientists collected more than 60,000 temperature readings to develop heat vulnerability maps⁷⁸ that found that the city's hottest areas correspond closely with areas with more development and fewer trees. Many of the neighborhoods with fewer trees were also Black and low income. Data and analysis from these maps helped inform several city planning processes, including the comprehensive plan update, the integrated watershed management plan, and the city's equity-centered climate action plan (RVAgreen 2050).

In **Grand Rapids, Michigan**, the city and its nonprofit partners developed an urban forestry scorecard that residents use to document the health of the trees in parks, rights of way, and other public properties (Friends of Grand Rapids Parks 2017). **Worcester, Massachusetts**, and **Providence, Rhode Island**, demonstrate how smaller cities—one coastal, one inland—are relying on green infrastructure and urban forests to help them regenerate and recover from the socioeconomic challenges of their industrial pasts and ensure that they have resilient systems in place to prepare for climate change and the uncertainties that lie ahead.⁷⁹ The City of Worcester's low impact development ordinance requires all new development and redevelopment to have no net increases in runoff rates, often leading to development conditions where larger developers build on-site stormwater management systems that relieve some of the burden on the city's outdated public stormwater system. Providence's 2020 comprehensive plan establishes policy goals that would increase the city's tree canopy 30 percent by 2030 and result in 200 trees' being planted each year. In collaboration with the city and a community

foundation, the Providence Neighborhood Planting Program offers grants for tree planting and preparation for free. The program and the city also sponsor a technical training for residents on how to care for young urban trees.

Neighborhood and Community Design



A Complete Streets makeover in the Beechwood neighborhood of Rochester, New York. Photo by Common Ground Health.

9. Complete Streets Design Principles (Practice, Policy)

Complete Streets promotes policy and design principles to “design streets that are safe and comfortable for everyone, regardless of age, ability, ethnicity, income, or chosen travel mode” (WSP Parsons Brinckerhoff 2017, 6). Complete Streets includes the following elements of design:

- active sidewalks, which are smooth and wide and have appropriate transitions to the street
- dedicated bike lanes, denoted by pavement markings
- safe crosswalks, which are clearly marked and allow pedestrians and wheelchair users to cross streets safely
- an active roadway, if possible, with one lane of cars in each direction and a two-way left turn lane in the center

These principles aim to make active transportation such as walking and bicycling safer and more convenient (Seskin 2012).

Theory of Change for Complete Streets Design Principles

Local officials or residents find streets to be unsafe for modes of transportation beyond automobiles



Planning or transportation department applies funds to redesign streets, prioritizing neighborhoods with the highest number of crashes



Municipal officials work with residents and transportation advocacy organizations to plan and complete project



Residents in the area have access to safer streets for multimodal transportation



Residents engage in more active transportation and have lower crash rates

CONNECTIONS TO HEALTH AND EQUITY

The evidence that Complete Streets design principles improve access to healthy streets is **moderate** (National Complete Streets Coalition and Bike Easy 2017). Complete Street projects have myriad health benefits for residents through their potential to reduce automobile crash rates, decrease automobile emissions, and increase rates of active transportation such as walking and biking. In a study of 37 Complete Street projects, Smart Growth America found that they increased biking and walking and in most cases reduced collision rates (Smart Growth America 2015).

Complete Streets design principles put equity at the forefront—they aim to increase accessibility and safety for all users, not just adults in cars. Local governments can increase equitable investments in Complete Streets designs by prioritizing neighborhoods with higher crash rates and fewer safe options for active transportation such as designated bike lanes, wide sidewalks, and marked crosswalks. Additionally, Complete Streets projects create the opportunity to open the transportation planning processes to the public. Through meetings, events, and creative outreach during Complete Streets adaptation and implementation, local governments and organizations can engage with residents—in particular, communities of color, low-income communities, and other communities traditionally underrepresented in the planning process.⁸⁰

An engaged planning process is necessary to incorporate context-specific considerations for Complete Streets design. For example, a representative of one suburban city with whom we spoke mentioned that some retail and service workers drive to and park in the downtown area to get to work. A plan to remove parking spaces and introduce bike lanes would affect those workers. Community engagement is crucial to understanding potential consequences, positive and negative, of Complete Streets plans.

PROMISING PRACTICES FOR SMALL AND MEDIUM-SIZE CITIES

Complete Streets adoption and implementation can vary depending on the city. Complete Streets is not a specified program or policy but a set of principles that can be incorporated with the lever that best suits a city's strengths and processes. For example, Complete Streets can be promoted through a policy or resolution that requires all streets under construction be rebuilt using Complete Streets design principles. Alternatively, Complete Streets may be applied through a comprehensive plan or a bicycle and pedestrian master plan. Complete Streets designs may also be implemented through a pilot program by a nonprofit organization.

Through its National Complete Streets Coalition, Smart Growth America has built a large body of evidence and resources around the Complete Streets design principles, including resources for local governments and organizations. Specifically, city projects should actively engage the community and be transparent at all levels of decisionmaking to ensure that projects meet the surrounding area's needs. This will allow the community to prioritize Complete Streets connections to places that need them most—for example, places that have ongoing safety concerns or need connections to employment opportunities, grocery stores, and parks (National Complete Streets Coalition and Bike Easy 2017).

In **Rochester, New York**, the health advocacy organization Healthi Kids included Complete Streets in its work to promote healthy systems and development for young people. Healthi Kids advocates for places—buildings, streets, and open spaces—that are safe and support healthy habits, and it has partnered with Genesee County Metropolitan Planning Commission to train planners across the region on Complete Streets principles and implementation.

In **Diamond Bar, California**, Complete Streets projects were motivated by both public demand and a state-level mandate to promote alternative modes of transportation. In its recently completed general plan, the City of Diamond Bar outlined its goals to make the city more walkable and conducive to active living.⁸¹ The city used Complete Streets design principles—including pedestrian walkways, bike lanes, and parking lots set away from the street—to outline its plan for reaching these goals. Diamond Bar

conducted the design and implementation phase with public input, support from outside consulting firms, and funding from the Los Angeles County Metropolitan Transportation Authority.

In **South Bend, Indiana**, Complete Streets has buy-in from across the city's departments. South Bend's investment in Complete Streets began with a commitment to convert the city's one-way streets into two-way streets. Motivated by the public health and economic health outcomes associated with Complete Streets principles, such as safer streets for pedestrians and bicyclists and increased access to businesses and community amenities, the City of South Bend committed to transforming each street using Complete Streets design. The city developed a resolution that whenever a construction opportunity arises, the streets will be designed with Complete Streets principles. Through the plan's implementation, proponents of Complete Streets design shifted the city officials' and engineers' mentalities toward seeing streets as spaces for all users, not just cars. The city officials we spoke with said this attitude is now ingrained in the city's thinking. In 2016, the City of South Bend received a Complete Streets award. One interviewee said: "The thing about health is, the curb radii on the street has as much to do with health as a sidewalk being there. If you can slow the car from going around the corner too fast, you're protecting pedestrians."

10. Comprehensive Zoning Code Reform for Health and Equity (Policy)

Zoning is perhaps the most prevalent land use policy tool available for cities to influence their built environments. Zoning codes, land use plans, and the local land development process help determine the form and function of our communities, which can serve as a significant social determinant of our health. Thus, research now documents how zoning and land use planning together have led to communities with inequitable developments that cause health disparities (Wilson, Hutson, and Mujahid 2008). Although the scope of zoning authority varies among states, nearly all incorporated local governments can adopt, administer, and enforce zoning codes and impose supplemental land use restrictions through land development approval processes and public hearing procedures. At its most basic level, the zoning code regulates the use of land and the placement of buildings. The zoning code (the actual written rules) does not take effect until the local government formally adopts its zoning map, which determines where land use categories (residential, commercial, industrial) and related regulations will apply. Zoning should be closely connected to the local governments' comprehensive land use plan, which lays out the vision and goals for a community's future built environment development. Although not legally enforceable in most states, comprehensive plans guide how the content of zoning laws applies and how the zoning map is drawn. Only a few states require legal consistency between comprehensive plans and zoning codes; in most communities, the plan is a factor to consider when implementing the code and making land use decisions.

Zoning can establish a legal framework that encourages healthy uses, activities, or development patterns, or zoning can discourage, limit, and in some cases prohibit land uses, building design, and infrastructure with negative impacts on community health. For example, some communities have zoning codes that limit the concentration of fast-food establishments within neighborhoods that have food deserts, while others have zoning regulations that support corner grocery stores that stock a certain amount of fresh food. Conversely, some zoning codes prevent or heavily regulate sources of fresh foods such as community gardens, urban farms, garden stands, or farmers' markets. Thus, the underlying policy goals (positive and negative) drive how communities put into practice the various dimensions of zoning that can support or harm health. How these dimensions play out in a particular community or neighborhood further explains the tremendous influence that zoning as a regulatory tool and institution has in shaping our built environment.

Another critical component of land use policy is the local land development process that approves new development and redevelopment of property and buildings within jurisdictions. This public process with its myriad hearings and procedures is how local governments transform their plans and codes into actual physical developments. Local planning and building departments typically coordinate the reviews and formal permitting of a developer's proposal to ensure that it complies with the relevant state and local comprehensive plans and building or zoning regulations. Planning commissions and zoning boards hold public hearings and make decisions and recommendations on the proposed development for approval by the city council or county board.

Amending or enacting one or two new zoning ordinances may not be enough to achieve a specific change in the built environment that can have positive health impacts. For larger cities, comprehensively reviewing, revising, and updating an entire zoning code can take three to six years or more, depending on the level of political leadership and support, in-house planning expertise, and engagement from the development community and local residents.⁸² Comprehensive zoning code reforms can generate community conflicts over issues such as density, affordable housing, and parking rules that require significant attention and resources. Although staff and consultants assigned to a zoning overhaul focus on those activities, other staff must concurrently administer the existing code. Communities have several different models and formats that they can adapt to fit their policy goals, community priorities, and urban form: the Form-Based Codes, Unified Land Development Code or Unified Development Ordinances, and the Sustainable Community Development Code Framework.⁸³

In the end, jurisdictions that take the time to align their land use plans with their zoning ordinance and streamline permitting for development can explicitly use these laws and practices to promote health and equity policy goals—such as active lifestyles, less pollution, and more access to nutritious

foods—as well as provide adequate and healthy homes at an affordable price and connect residents of all income levels and races to high-quality jobs. Thus, coordinating zoning reform with planning strategies, such as smart growth, and land development processes is more likely to achieve a built environment that encourages better health outcomes (Cervero and Duncan 2006; Nicholson, Leider, and Chriqui 2017).

Theory of Change for Comprehensive Zoning Code Reform for Health and Equity

Land use plans, zoning codes, and land development processes are outdated, ineffective, and inefficient and often lead to unhealthy environments and health disparities in communities of color



Local government reviews, revises, and adopts citywide comprehensive land use plans and neighborhood-specific plans that infuse health and health equity as policy priorities



Local government reviews, revises, and adopts citywide zoning code, zoning map, and land development processes that infuse health and health equity as policy priorities



Local government coordinates implementation of plans, codes, maps, and development processes through the lens of health and health equity



Local government approves development and infrastructure projects that generate co-benefits that provide more equitable access to healthy land uses, amenities, and assets



Developers build more equitable projects that follow local government approvals, plans, and codes



Individual and community health improves for residents, workers, and property owners

CONNECTIONS TO HEALTH AND EQUITY

Zoning has a complicated history. Public health was one of the primary drivers in zoning's policy lineage, with provisions for separating buildings and residential uses from toxic industrial land uses (Schilling and Linton 2005). Decades later, researchers, advocates, and policymakers found that these land use rules designed to protect public health were contributing to suburban sprawl and the nation's obesity epidemic and had been used to intentionally segregate people of different races.

Zoning also has a legacy of perpetuating residential segregation through exclusionary zoning restrictions and discriminatory land use policies that essentially limit how low-income communities and communities of color access jobs, high-quality schools, and affordable and high-quality housing (Trounstein 2018).⁸⁴ Zoning's separation of uses can result in the locating of affordable, multifamily apartments close to highways or heavy industry that risks exposing residents to air pollution (Maantay 2001; Rothstein 2017). This is another example of how low-income communities and communities of color are more likely to live in neighborhoods that can increase their exposure to environmental hazards such as poor air quality (indoor and outdoor), contaminated land, and polluted water.

With respect to the positive influence that zoning can have on public health, the research is strongest within two of our policy domains—food security, health, and nutrition and active living assets and facilities. Indeed, one could argue that the active living movement and the Robert Wood Johnson Foundation's active living initiatives launched in 2002 were at the center of a renewed call to action for reforming zoning codes that still percolates today (Schilling and Mishkovsky 2005).

PROMISING PRACTICES FOR SMALL AND MEDIUM-SIZE CITIES

Zoning codes in many cities have not been updated for decades. City officials routinely amend their codes on a case-by-case, issue-by-issue basis, resulting in a patchwork of provisions that can generate inconsistencies and create confusion for property owners, residents, and city staff. The policy goals and community contexts that drove many older codes were very different from those of today: what was relevant 20 to 40 years ago, in an era of white flight suburbanization and during industrialization-driven economic growth, may no longer be relevant. Thus, more cities are comprehensively reexamining their zoning codes. Ideally, zoning code reform would happen right after a city updates its comprehensive land use plan. This was the case in **Blue Springs, Missouri**, where the city updated its comprehensive plan and then its zoning code with a focus on encouraging residents' physical activity by providing bike and pedestrian connections to the city's numerous surrounding parks and lakes. Outside that example, the American Planning Association has a list of principles that encourage communities to infuse principles and policies of health into their land use plans and practices (American Planning Association 2015). These embed health into the built environment by ensuring that zoning codes

- encourage more walking and biking by allowing mixed-use or compact residential development, increasing sidewalk widths and coverage, permitting bike lanes, requiring bike parking throughout a city, and reducing minimum parking mandates;
- allow for more green space and recreation centers;

- prioritize healthy food access (e.g., allowing farmers' markets, farm stands, community gardens or urban farms, corner stores, and grocery stores within or near residential areas);
- require all transit stops be accessible by sidewalk; and
- ensure quick access to health care centers.

Other examples of small cities that have prioritized these elements include **Albert Lea, Minnesota**;⁸⁵ **Grand Rapids, Michigan** (Ricklin and Kushner 2013); and **Hernando, Mississippi**.⁸⁶

As health and equity have become pressing priorities for many communities, it would behoove local officials to revise zoning codes in ways that better reflect health and equity policy goals and outcomes (American Planning Association 2016). One way to ensure that a comprehensive zoning overhaul elevates and prioritizes health and health equity is to conduct a health impact assessment when updating the comprehensive plan, a comprehensive zoning reform, or land development processes (ARHF and ARC 2006; Health Impact Project 2016; Ricklin et al. 2016). Although Baltimore is not a small city, a cross-disciplinary team from Johns Hopkins University completed one of the first health impact assessments to examine the city's comprehensive rewrite of its 50-year-old zoning code. The findings were shared during the city's initial review and public comment process, but the entire zoning code update took roughly six years before the city council formally adopted the new code. The health impact assessment's analysis focused on the proposed zoning code revisions with strong evidence that they could have a positive impact on community health, such as reducing crimes and increasing access to healthy foods. For example, the assessment seemed instrumental in leading to zoning code changes that retroactively applied new regulations on corner stores and alcohol to existing stores (Johnson Thornton et al. 2013; Stacy et al. 2019).

Observations and Reflections: Promising Practices to Achieve Health Equity through the Built Environment

Across the municipalities where our interviewees were based, we observed several cross-cutting themes and promising built environment strategies that cities are using to encourage positive health outcomes and help ensure health equity for all their neighborhoods and residents. Our interviews with practitioners and experts covered all six of our domains and highlighted dozens of interventions that illustrated the mutually reinforcing relationships among the 5 Ps—policies, plans, programs, projects, and practices. Below, we reflect on the breadth and the depth of our research questions: (1) What did we learn about equity and the built environment interventions? and (2) What did we learn about the implementation of built environment interventions in small to medium-sized cities and their potential impact on community health?

One caveat to this analysis is that population size alone may not be a determining factor in the ability of a city to promote health equity through the built environment. Although big cities have an advantage when it comes to resources and staff, small and medium-size cities can tackle health and equity using strategic and flexible approaches. These cities still have capacity challenges because of limitations on staffing and budgets, but we found promising strategies that cities big and small can learn from.

Applying an Equity Lens to Built Environment Interventions

A consensus existed among our interviewees that the built environment affects health.⁸⁷ Nearly all our interviewees used or knew the term “social determinants of health,” and most shared how built environment features in their community are promoting or hindering community health. However, how the interviewees’ cities connect built environment interventions to health varied widely. In some communities, health is the primary factor motivating a specific intervention. In others, different goals—like urban planning, community and economic development, and tourism—are motivating the built

environment interventions. Interviewees understood that health benefits could be a co-benefit of urban planning, economic development, or tourism-related projects, but many acknowledged that they were often not the primary goal.

Measuring the impact of the divergence between interventions motivated by health and those motivated by other needs is difficult. Although any health-promoting intervention is good (even if health promotion was not intended or was a secondary goal), one could argue that interventions implemented in response to a specific health challenge are more likely to achieve certain health outcomes. This is particularly likely to be the case when the goal extends to promoting *health equity* and not only health. Given that the policy legacy of housing segregation, redlining, and other dimensions of structural racism caused communities of color to be built and developed in ways that caused residents to suffer disproportionately from the associated negative health outcomes, it now seems obvious that to achieve health equity—that is, a fair and just chance at good health for everyone—cities need to focus resources and built environment interventions on the communities that need them the most.

In many of our interviewees' cities, "equity" is still a relatively new concept that has roots in the environmental justice and equitable development movements (von Hoffman 2019). In philanthropic circles, the term spread widely only within the past five years.⁸⁸ Some of our interviewees shared that they have developed equity teams, set equity-based goals, and developed equity action plans, while others said they do not think much about equity, think about it but don't call it "equity" within city hall, or are just starting to think about it.

But cities can do a lot to achieve health equity, and many of our interviewees' cities are engaging in that work. Many of the following actions are changes to **practices**, rather than new policies or programs.

- **Use health impact assessments and community health needs assessments to understand how populations are disproportionately affected by particular health challenges or could be affected by new developments or policies and programs.** In cities like Spokane, Washington; Lansing, Michigan; and Elmira, New York, stakeholders are teaming up to conduct health impact assessments for proposed developments and using hospitals' community health needs assessments to understand community health challenges. Health impact assessments can help communities identify the potential health-related impacts of a project; evaluate the proposed project using data, stakeholder input, and community engagement; and make recommendations for how the project can minimize health risks and maximize health benefits.⁸⁹ Cities can also track pre-and post-implementation data to better understand health impacts that occur as a result of a new built environment intervention.

- **Engage people who have experienced systemic racism and neighborhood disinvestment in planning for new interventions, and make sure that the messaging, design, and implementation of interventions are culturally specific to community residents and build on existing community assets.** In many communities, decades of disinvestment, systemic racism, and decisionmaking without the input of residents with lived experience have led residents to lose trust in the government and service providers and to disengage from community engagement activities. In Arcata and Oxnard, California; Kalamazoo, Michigan; Rochester, New York; and Hawaii County, Hawaii, city government officials and their partners are working to engage these residents in planning for built environment interventions like school campus redevelopments, regional trail systems, and Complete Streets efforts and to create culturally specific education and awareness events to encourage their use. In many places, local governments have invested in departments of resident engagement, have created cultural ambassador positions, and are working to provide translation services at public events.⁹⁰ In Lansing, the city began its Neighborhoods of Focus initiative, which prioritizes neighborhoods for revitalization efforts and additional funding opportunities, by conducting asset-based community development modeling.⁹¹ In doing this work, race should be addressed directly in solutions and not just framed as an issue. Cities should also address barriers to representation and meaningful participation in engagement activities.
- **Formalize how to address equity by examining and modifying internal structures and systems.** As cities across the country seek to increase equity in their communities, many have recognized that they must examine their internal structures and systems before setting out to address problems in the community. To do this, municipalities are beginning to hire chief equity officers, develop “equity in all policies” approaches, and develop plans to increase equitable development. In Tempe, Arizona, the city is developing an Equity in Action Plan that seeks to increase the engagement of underrepresented populations in city planning and decisionmaking.⁹² In Lansing, Michigan, the Ingham County Health Department passed a departmental health equity policy to formalize the ways that the department works to promote health equity and social justice.⁹³ In Kalamazoo, Michigan, the city hired a diversity, equity, and inclusion director in early 2020 who will sit in the city manager’s office. The motivation for this decision came after hearing from residents during the Imagine Kalamazoo 2025 master planning process that reducing bias and increasing acceptance of people from all walks of life was a priority in the community.⁹⁴
- **Train city staff to demonstrate empathy and employ better listening techniques in their interactions with residents.** Understanding how past traumas have affected communities of

color and how communities may perceive or experience their life situation is crucial to addressing equity challenges. Local governments, service providers, and their partners can work toward a more equitable distribution of power by training staff in inclusive communication and helping them recognize the biases they bring to their work. In Spokane, Washington, the health district is providing unconscious bias training to department staff and helping them understand how the work they do is contributing to or hindering health equity. In Lansing, Michigan, the Economic Development and Planning Department received active listening training to be able to better understand challenges that residents are having in keeping properties up to code and activate a plan based on what they are hearing. In Dubuque, Iowa, city government employees received instruction on communicating cultural differences and navigating conflict (Nelson et al. 2015). All these efforts help city staff relate better to residents and translate their understanding of challenges into action.

- **Use people-centered health data and disaggregated data to prioritize communities for additional funding, staff time, and resources.** As we have shown, myriad programs, policies, and practices can increase positive health outcomes. But to promote health *equity*, cities need disaggregated health data that show which communities and populations are disproportionately affected by certain health challenges. With this information, cities can prioritize the dispersal of resources or funding or the allocation of additional staff time to address challenges in these places. In Lansing, Michigan, the “neighborhoods of focus” can jump to the front of the line whenever new funding or resources become available. Cities should also focus on using data that is people-centered rather than environment-centered. For example, in assessing health and weather data to inform how to design bike paths, playgrounds, and parking lots, the City of Tempe, Arizona, collected median radiant temperature to show how people experience heat, rather than surface temperature, which shows how hot surfaces become.
- **Acknowledge and attempt to mitigate potential adverse effects of built environment interventions.** In addition to thinking about the positive benefits that health-promoting built environment interventions might have, cities must acknowledge the potential adverse effects of some interventions and work to mitigate them. As has been publicized in the media and validated by research studies, new home construction, transportation upgrades, and the development of parks, trails, and green spaces can gentrify communities and displace long-term residents.⁹⁵ A 2019 study in 10 major cities that analyzed the likelihood of gentrification near parks built in census tracts whose median household incomes were below the city’s median

found that “the presence of greenway parks with a transportation function increased the odds of gentrification by 145 percent” (Rigolon and Németh 2020, 13).

Strategies to Overcome Implementation Challenges

Compared with large cities, small and medium-size cities have few resources to reach the same health and equity goals. Across our interviews, we found small and medium-size cities of all types and trajectories (from a legacy city such as Rochester, New York, to fast-growing suburban cities such as Sunnyvale and Oxnard, California) leveraging their networks to elevate and implement health-promoting policies, plans, and programs across the domains we researched. A common denominator was their ability to align staff within and across city departments with health and equity goals and actions and maintain their focus despite typical changes in staff or policy priorities. Sometimes maintaining focus is difficult for the largest cities with entrenched bureaucracies and for the smallest cities, especially in rural areas, where limited revenue and staffing can inhibit the delivery of essential municipal services. The interplay of these cities within the regional context—markets and governance—offer another important insight as several of the smaller cities we found through our research and interviews were involved with regional coalitions and networks that fostered collaboration and provided new capacities across and within these smaller municipalities. Considering the range of barriers and potential issues that can arise, many small and medium-size cities are working hard to implement a range of built environment interventions that can have positive outcomes for health and health equity by using some of the following strategies:

- **Joining national networks with peer cities to increase knowledge and information sharing.** About two-thirds of the cities where our interviewees are based participate in national peer-learning networks or have participated in city-to-city exchange programs to learn from what other communities are doing. Our interviewees said their cities were members of organizations or part of programs run by the Government Alliance on Race and Equity, the National League of Cities, the National Association of Counties, the National Association of County and City Health Officials, the Global Covenant of Mayors for Climate and Energy, and the Robert Wood Johnson Foundation. Importantly, although some interviewees said their cities can follow what larger cities are doing, many interviewees stated that what larger cities do is “irrelevant” to them because their cities do not have the staff capacity, resources, or funding to match what larger cities do. Even so, cities should not use this rationale to justify inaction on equity issues.

Networks that focus on race and equity, like the Government Alliance on Race and Equity, can provide support that is appropriate to a city's size and capacity.

- **Establishing regional and local health-focused collaboratives that engage diverse cross-sector health and planning partners to increase municipal capacity, facilitate policy change, and better align work.** Local governments across the US are making great strides to address health challenges in their communities, but they are not doing it alone. Collaborative partnerships (often run by nonprofit organizations and intermediaries) like Common Ground Health in Rochester, New York (box 5); Sustainable Princeton in Princeton, New Jersey; PATH in Hawaii County, Hawaii; and the Land Use and Health Resource Team in Lansing, Michigan, work together to bridge the gap between the health and planning fields. By working in collaborative cross-sector or cross-departmental teams, these intermediaries can increase one another's capacity and better strategize about how to use limited funds to promote positive health outcomes. As with any collective impact process, a crucial ingredient to success is having a backbone organization or intermediary that can bring together diverse voices and offer technical assistance services.

BOX 5

Common Ground Health: A Regional Health Planning Intermediary in Upstate New York

During our interviews, we identified several nonprofit intermediaries that work with smaller cities and towns on built environment interventions across all six domains. These smaller municipalities and their partners could not effectively advance their interventions and the underlying policy goals of health and health equity without the support of intermediaries. These nonprofit groups play crucial roles; they convene and facilitate cross-sector, cross-agency policy collaborations; do health impact research and health data analysis; conduct social marketing and health-promotion campaigns; engage community organizations and local leaders; and provide direct program and technical assistance.

A prime example is Common Ground Health in Rochester, New York. One of the original federal health systems planning agencies established in 1975, Common Ground expanded its programming about 15 years ago to focus on the intersection of clinical and community health. Now serving the nine urban and rural counties in the Finger Lakes region, Common Ground gathers regional health measures,^a provides data analysis, and then spotlights the evidence of the region's health disparities through communications, reports, policy briefs, and convenings with regional and local leaders and organizations across sectors (Common Ground Health 2019a). Along with project-specific health impact assessments, Common Ground recently completed the 2019–21 regional community health assessment, which outlines health improvement plans to address regional community health priorities (Common Ground Health 2019b).

Our interviews with Common Ground's directors and teams highlighted two programs relevant to our active living assets and facilities domain. The first is the Empire State Trail Health Impact Assessment, which illustrates Common Ground's collaborative capacity by bringing together state, county, and local government leaders with regional philanthropy and health, aging, and trail nonprofits and advocates to examine how current and future trail expansion projects can expand equitable access for low-income communities of color.^b Preliminary surveys and community conversations found examples in which residents from predominately white neighborhoods were engaged in the planning process and in the use of the trail while nearby Black residents historically were underrepresented in using the existing trail. The health impact assessment steering committee is working hard to find out why and what can be done to ensure equitable use and access for the pending expansion of the trail. As part of the assessment process, the steering committee examined relevant data from a vulnerable populations index and a land use and access point study. The health impact assessment process also enables new cross-sector conversations on the trail's potential public health benefits with groups and organizations that do not typically consider health in their state and local transportation development, programming, and planning activities.

The second Common Ground program relevant to our active living assets and facilities domain is the Healthi Kids coalition,^c which blends data and research on health and health equity with advocacy and on-the-ground policy and program development and assistance. The data analysis and surveys featured in Common Ground's *Overloaded* report made a compelling case that poverty and neighborhood disinvestment in Rochester had affected the diet, nutrition, physical health, and mental health of children, impeding their development, education, and opportunities.^d Healthi Kids responded with a multifaceted whole child health advocacy strategy, including civic engagements about the power of play and neighborhood design that married content experts with local context experts. By piloting placemaking strategies such as PlayROCs,^e the coalitions and networks convened by the Healthi Kids team influenced the city to expand its capacity around active transportation practices and policy systems by adopting a Complete Streets policy and the integration of play and placemaking in the city's comprehensive plan. By engaging with residents and community-based groups, Healthi Kids elevated and leveraged local voices into changing built environment practices and policies in the city.

^a "Regional Health Measures," Common Ground Health, accessed June 11, 2020

<https://www.commongroundhealth.org/insights/regional-health-measures>.

^b "Empire State Trail Health Impact Assessment," Common Ground Health, accessed June 11, 2020

<https://www.commongroundhealth.org/collaborations/empire-state-trail-health-impact-assessment>.

^c "Healthi Kids Coalition," Common Ground Health, accessed June 11, 2020.,

<https://www.commongroundhealth.org/collaborations/healthi-kids-coalition>.

^d "Study Finds Region's No. 1 Health Concern Is Poverty," Common Ground Health, November 18, 2019,

<https://www.commongroundhealth.org/news/articles/study-finds-regions-no-1-health-concern-is-poverty>.

^e "Rochester Kids and Adults Reclaimed Their Neighborhood for Play," Common Ground Health, July 13, 2019,

<https://www.commongroundhealth.org/news/articles/rochester-kids-and-adults-reclaimed-their-neighborhood-for-play>.

- **Partnering with anchor institutions, regional health intermediaries, community development financial institutions, and community foundations so that they can lend their influence and capacity to health equity-promoting projects, including by providing funding and helping with data collection and analysis.** Many small and medium-size cities struggle to access and incorporate health-related data into policymaking and to adequately fund some health-focused interventions. But an increasing understanding of how the social determinants affect health has meant that more nontraditional stakeholders like hospitals, health systems, universities, major employers, and community foundations are beginning to lend their dollars, their data, and their expertise to community health initiatives. In Utah, the Intermountain Healthcare system partnered with other organizations to create and help fund a housing trust fund. In Kalamazoo, Michigan, the Foundation for Excellence, a foundation of private donors, is helping fund the city's lead remediation and affordable housing production efforts.⁹⁶
- **Engaging universities, cooperative extensions, nonprofit groups, and research organizations to provide technical assistance and evaluate the impact of interventions.** Aside from speaking with local government employees, we interviewed a few technical assistance providers who work with cities and counties to help implement built environment interventions. The people we spoke with highlighted the need that many communities have for more technical assistance, grant writing, and evaluation support, as well as the need for smaller funding streams. In West Virginia, where most cities have fewer than 5,000 people, the Land Use and Sustainable Development Law Clinic at the West Virginia University College of Law does legal analysis and drafting of local government land use plans and ordinances. Also, the University of New Hampshire Cooperative Extension provides technical assistance to towns and communities across the state on several built environment domains. Our interviewee there stated that in many of the communities where the cooperative extension works, technical knowledge is a challenge, especially because many towns have only part-time or volunteer staff to navigate what are often complex federal grant processes. The cooperative extension helps communities search for available funds, write grant applications, and document progress if the communities receive funds.
- **Hiring student interns, AmeriCorps VISTAs, urban fellows, and other “surge capacity” to supplement staff capacity, especially around innovation.** Most of our interviewees expressed a desire to do more to achieve health equity but stated that they have few staff members to focus on work that is not part of their daily jobs. To overcome staff capacity challenges, one interviewee said the city employs student interns and AmeriCorps VISTAs to work on projects. Interestingly, this interviewee shared that the students and VISTAs have been instrumental in

helping the department be more innovative—the students work with the city as part of a university service-learning studio class and/or capstone projects focused on addressing a specific challenge in the city.

- **Ensuring planning is a strong platform and catalyst for action.** City officials' formal adoption of plans that promote health and equity often serves as the foundation for moving policy ideas into action. Although the health impact is difficult to quantify or measure, a plan sets the direction for many of the programs, projects, and practices that follow. For example, comprehensive land use plans that include broad health and equity goals and concrete policy elements can guide corresponding health-related changes to zoning codes and land development processes. Also, the public process of drafting a plan is often done with extensive and direct involvement by residents—in addition to government, nonprofit, and institutional stakeholders and partners—which helps elevate community health and equity.
- **Improving policy, plan, and program implementation by closely aligning work with supportive practices and projects.** Although updating city ordinances and implementing programs is integral to making changes to the built environment, many interviewees also touted the importance of improving internal practices—for example, by providing better customer service, simplifying grant application processes, and coordinating across city departments—to address implementation challenges more effectively.

Conclusion

As we reflect on our research and the insights shared with us by practitioners and experts, several outstanding research questions remain:

- What is the role of state government in enabling or hindering the ability of smaller cities to adopt and implement built environment interventions that promote health and equity?
- How can the diverse capacities of smaller cities be better documented, assessed, and compared with those of larger cities?
- How do characteristics of cities such as size, geography, and type (e.g., center city, suburban, small rural) influence the effectiveness of their interventions to influence health and equity across the local policy continuum? Could a more in-depth analysis of health outcomes data relative to these city characteristics identify potential relationships with city type and built environment interventions?
- How can new methods and approaches be employed for researching, mapping, and assessing the strength and power of smaller city networks and their role and influence in collaborative policymaking and systems change?
- What is the impact of using health impact assessments earlier in the planning process?

No single intervention will address the complexities of health and equity through the built environment. Complex problems like this demand collaborative approaches. Despite capacity limitations and other implementation challenges, our research highlights how small and medium-size cities are joining with health intermediaries and community partners to better understand local health challenges, engage with residents, and implement equity-promoting built environment interventions.

Appendix A. City Demographics

The tables below present summary demographics, economic and housing demographics, and health indicators for the cities where our interviewees are based. We include these statistics so a reader can explore how examples in the report might apply to cities with similar demographics.

TABLE A.1
Summary Demographics for Interviewees' Cities

City	Region	City type	Metro-area population	City population (2018)	Population trend	Hispanic or Latino (%)	White (%)	Black or African American (%)	American Indian or Alaska Native (%)	Asian (%)	Native Hawaiian and other Pacific Islander (%)
Kalamazoo, MI	Midwest	Center	336,845	76,040	Plateau	6.8	64.2	20.8	0.1	2.1	0.02
Lansing, MI	Midwest	Center	476,615	116,699	Plateau	12.5	54.9	21.4	0.4	3.5	0.01
South Bend, IN	Midwest	Center	320,700	102,233	Plateau	15.3	52.8	26.0	0.3	1.5	0.09
Chicopee, MA	Northeast	Suburban	630,275	55,661	Plateau	20.6	71.4	4.1	0.1	2.1	0.00
Concord, NH	Northeast	Small rural	149,452	43,040	Plateau	2.8	86.9	2.9	0.4	4.8	0.00
Rochester, NY	Northeast	Center	1,074,667	207,778	Losing population	18.3	36.6	38.2	0.2	3.2	0.01
Princeton, NJ	Northeast	Center	368,762	30,728	Growing	7.7	67.7	5.6	0.0	16.4	0.00
Richmond, VA	South	Center	6,138,382	223,787	Growing	6.7	40.4	47.5	0.1	2.1	0.01
Greenville, SC	South	Center	883,853	65,727	Losing population	0.4	38.7	56.1	0.0	2.7	0.00
Arcata, CA	West	Small rural	135,768	18,050	Plateau	16.5	71.7	2.3	1.0	2.2	0.39
Diamond Bar, CA	West	Suburban	13,262,234	56,434	Plateau	19.3	19.0	3.8	0.3	54.9	0.56
Hilo, HI	West	Small rural	197,658	46,284	Plateau	10.6	16.1	0.6	0.2	32.1	8.99
Kailua-Kona, HI	West	Small rural	734,502	15,268	Growing	14.9	26.7	0.5	0.1	22.4	18.93
Oxnard, CA	West	Suburban	848,112	207,568	Plateau	73.7	14.8	2.3	0.3	7.0	0.27
Sunnyvale, CA	West	Suburban	1,981,616	152,323	Growing	17.3	31.2	1.6	0.2	45.7	0.22
Spokane, WA	West	Center	555,308	214,804	Plateau	6.5	81.4	2.1	1.5	2.6	0.79
Ogden, UT	West	Center	652,744	86,126	Plateau	32.5	61.2	1.5	0.7	1.2	0.23
St. George, UT	West	Small rural	160,537	82,194	Growing	13.0	80.4	0.7	1.2	0.9	1.31
Tempe, AZ	West	Center	4,673,634	183,652	Growing	22.4	56.8	6.2	2.4	8.8	0.25

Source: Authors' analysis of 2014–18 American Community Survey five-year estimates.

Notes: City type was based on urban planning concepts that catalogue cities by their spatial location within metropolitan regions, past and present development patterns and urban form, population size, etc. The population trend for each municipality was defined by comparing the population in 2013 with the population in 2018.

TABLE A.2

Economic and Housing Demographics for Interviewees' Cities

	Share below 100% of FPL	Share between 100% and 149% of FPL	Unemployment Rate							Homeowner (%)	Renter (%)	Housing Cost Burden of 35% or More	
			Total	Hispanic or Latino	White	Black or African American	American Indian or Alaska Native	Asian	Native Hawaiian and other Pacific Islander			Renter (%)	Owner (%)
Kalamazoo, MI	30.4	12.5	8.9	11.1	6.0	18.4	23.5	8.9	—	44.8	55.2	42.6	16.6
Lansing, MI	26.1	11.4	9.0	7.8	7.2	13.2	12.5	4.2	0.0	50.6	49.4	42.8	19.0
South Bend, IN	23.8	13.3	7.5	6.7	4.9	14.5	0.0	0.0	30.4	56.9	43.1	42.8	17.2
Chicopee, MA	15.3	11.2	6.8	9.7	5.2	16.4	0.0	0.9	—	57.0	43.0	39.7	19.2
Concord, NH	10.1	5.8	4.3	8.6	3.8	14.3	0.0	7.4	—	53.9	46.1	39.4	19.1
Princeton, NJ	5.8	3.6	2.7	3.2	2.7	4.0	22.2	5.7	0.0	59.3	40.7	35.6	17.8
Rochester, NY	32.6	13.6	11.3	15.7	5.2	17.5	13.1	6.7	—	36.3	63.7	49.3	21.4
Greenville, SC	24.4	18.2	8.9	2.5	4.0	10.1	0.0	0.6	0.0	42.7	57.3	34.7	14.4
Richmond, VA	24.5	11.1	7.1	6.7	4.3	11.8	11.7	6.8	50.0	42.2	57.8	46.9	25.5
Arcata, CA	37.4	10.5	9.3	26.5	8.8	15.3	0.0	7.5	0.0	39.8	60.2	68.5	31.7
Diamond Bar, CA	6.3	6.3	5.9	8.0	4.5	10.0	8.8	4.4	23.1	75.8	24.2	48.9	31.0
Hilo, HI	19.0	8.3	5.6	14.1	5.3	30.6	0.0	2.6	9.1	60.6	39.4	46.2	22.0
Kailua-Kona, HI	9.6	7.4	2.8	2.8	3.9	0.0	—	0.0	5.8	51.1	48.9	25.4	32.2
Oxnard, CA	14.3	14.0	6.9	7.2	5.0	4.7	10.5	8.5	3.5	53.7	46.3	48.3	32.1
Spokane, WA	18.3	10.3	5.9	8.4	5.4	9.5	18.8	2.8	19.1	55.2	44.8	41.6	21.3
Sunnyvale, CA	5.8	4.1	4.5	4.5	4.3	12.2	13.6	4.1	21.1	46.4	53.6	27.2	20.8
St. George, UT	14.6	10.4	4.3	4.0	4.0	0.0	10.2	8.6	8.1	65.0	35.0	44.4	22.5
Ogden, UT	19.6	12.1	5.8	5.5	5.8	10.6	16.2	3.0	0.0	56.4	43.6	37.7	18.7
Tempe, AZ	21.3	8.7	5.1	4.8	5.1	6.7	5.0	6.7	0.0	40.1	59.9	41.5	18.2

Source: Authors' analysis of 2014–18 American Community Survey five-year estimates.

Note: FPL = federal poverty level.

TABLE A.3

Health Indicators by Domain for Interviewees' Cities

	Housing		Active Living		Neighborhood and Community Design		Food Policy		Urban Greening/Infra.	General	
	Asthma (%)	Housing with potential lead risk (%)	Cardiovascular disease deaths per 100,000 people	Physical inactivity (%)	Park access (%)	Walkability	Limited access to healthy food (%)	Obesity (%)	Air pollution	Life expectancy (years)	Opioid overdose deaths per 100,000 people
Kalamazoo, MI	11.5	32.0	199.6	26.8	60.6	47.6	65.2	32.5	8.7	76.9	28.1
Lansing, MI	11.4	31.2	230.6	28.0	77.6	43.3	75.4	35.1	8.5	77.5	35.8
South Bend, IN	10.3	34.0	237.1	34.3	65.7	42.6	71.8	37.9	9.1	76.4	22.5
Chicopee, MA	—	37.2	—	—	57.0	42.7	74.5	—	6.4	78.5	—
Concord, NH	—	—	—	—	—	—	—	—	—	—	—
Rochester, NY	12.0	46.3	320.3	32.6	82.4	64.9	51.4	36.3	6.7	76.7	29.0
Princeton, NJ	—	—	—	—	—	—	—	—	—	—	—
Greenville, SC	—	17.3	—	—	51.1	43.0	79.3	—	10.0	77.8	—
Richmond, VA	10.8	34.5	198.8	28.3	77.2	52.2	66.8	33.6	8.2	75.3	25.7
Arcata, CA	—	—	—	—	—	—	—	—	—	—	—
Diamond Bar, CA	—	6.6	—	—	35.0	29.3	67.7	—	12.7	84.6	—
Hilo, HI	—	—	—	—	—	—	—	—	—	—	—
Kailua-Kona, HI	—	—	—	—	—	—	—	—	—	—	—
Oxnard, CA	9.0	12.4	175.7	25.3	83.4	55.4	49.8	26.1	8.9	80.1	7.9
Sunnyvale, CA	7.0	15.1	133.4	14.9	57.8	58.7	33.4	17.0	7.9	83.2	3.3
Spokane, WA	11.2	30.9	202.7	22.1	82.3	48.6	58.5	29.3	9.7	77.6	13.7
St. George, UT	9.2	3.9	140.2	23.5	48.3	29.6	87.5	25.0	5.2	81.3	22.1
Ogden, UT	10.0	27.1	235.4	26.2	79.6	45.6	64.7	33.8	8.3	77.0	26.5
Tempe, AZ	10.4	7.2	194.9	21.6	64.1	53.3	48.9	26.1	8.1	79.4	8.4

Sources: City Health Dashboard (housing with lead risk, cardiovascular disease, physical inactivity, park access, walkability, healthy food access, obesity, air pollution, life expectancy, and opioid overdose);

"500 Cities: Local Data for Better Health," Centers for Disease Control and Prevention (asthma).

Notes: The health indicators were selected because they are relevant outcomes or inputs to the six policy domains. Asthma = percentage of residents older than 18 who reported having been told by a doctor, nurse, or health professional that they have asthma (2017). Housing with potential lead risk = the percentage of the city's housing stock with potential elevated lead risk (2018). Cardiovascular disease deaths = deaths because of cardiovascular disease per 100,000 people (2017). Physical inactivity = no leisure-time physical activity in past month among adults 18 years or older (2017). Park access = percentage of the population living within a 10-minute walk of green space (2018). Walkability = neighborhood amenities accessible by walking, as calculated by Walk Score (2019). Limited access to healthy food = population living more than half a mile from the nearest supermarket, supercenter, or large grocery store (2015). Obesity = percentage of adults 18 years or older who are considered to be obese (2017). Air pollution = average daily concentration of fine particle matter per cubic meter (2016). Life expectancy = the average life expectancy at birth (2015). Opioid overdose deaths = the number of opioid overdose deaths per 100,000 people (2017).

Appendix B. 72-City Data Analysis Methodology

To get a better picture of health equity in small and medium-size cities, we assembled health-related, demographic, and city characteristic data (see appendix A and the supplemental document on our project website for this data) for the 19 municipalities where our interviewees were based and an additional 53 “peer” cities across the country and conducted a regression analysis to observe the relationship between demographic and city characteristic explanatory variables and health-related outcome variables. We selected our peer cities because they shared one or more of the following characteristics with many of the 19 municipalities: similar city type (suburban, central city, etc.), range of population (small or medium-sized), and location within the same metropolitan region or the same state/part of the country. Several were selected because they had launched promising built environment interventions found in our online search of journal articles, policy reports, and case studies. The health-related data were collected from City Health Dashboard and the 500 Cities: Local Data for Better Health dataset, and the demographic data were compiled from the American Community Survey’s 2014–18 five-year estimates published by the US Census Bureau. All collected data are for the most recent year available as of May 22, 2020.

We chose a multivariate linear regression model to observe the relationship between demographic and city characteristic explanatory variables and health-related outcome variables. For each health-related outcome, we regressed the chosen explanatory variables for each city “i.”

$$\begin{aligned} \text{Health-Related Outcome}_i = & \text{Non-White Population Percentage}_i * \beta_1 + \text{High Poverty Factor (0 or 1)}_i * \beta_2 \\ & + \text{Suburban City Type Factor (0 or 1)}_i * \beta_3 \\ & + \text{Small Rural City Type Factor (0 or 1)}_i * \beta_4 + \epsilon_i \end{aligned}$$

Outcome variables: The health-related outcomes we chose to analyze were “housing with potential lead risk,” “park access,” “walkability,” and “limited access to healthy food.” These outcomes were chosen because they represent the six environmental domains that this report focuses on: safe, healthy, and affordable housing; active living assets and facilities; regional and local infrastructure; food security, health, and nutrition; vacant property reclamation and urban greening; and neighborhood and community design.

Explanatory variables: In line with this report’s focus on social and economic determinants of health, we identified race and poverty as our explanatory variables. We used the percentage of the

population composed of people of color as the indicator for “race.” This variable was generated by dividing “white alone” by the total population and then subtracting that value from 1. For “poverty,” we created a factor variable that assigned 1 for “high poverty” ($n = 10$) if the income of more than 30 percent of the population was below the federal poverty level and assigned 0 otherwise (low poverty; $n = 57$). As the third explanatory variable, to examine the relationship between the build of a city and health-related outcomes, we included “city type,” grouped into three categories: center ($n = 39$), suburban ($n = 12$), and small rural ($n = 16$) cities. “City type” was represented by two factor variables – suburban (assigning 1 if suburban and 0 if otherwise) and small rural (assigning 1 if small rural and 0 if otherwise); we used city center as the reference city type because it was the most prevalent type in the dataset.

City sample: Five of the 72 cities were removed from the analysis because of missing city type characterization. Of the 67 cities that included a city type code, 14 (21 percent) had incomplete data for four of the health-related indicator variables. The final sample was 53 small and medium-size cities.

Constraints: These analyses are limited in terms of their statistical validity and generalizability. The primary constraint was the small sample size of 72 small and medium-size cities (of which there were nearly 20,000 in the United States as of July 2019). That number was further reduced because of missing city type and health-related indicator data (primarily for small rural cities). The addition of factor variables, although valuable for analyzing the relationship between city size and health-related outcomes, further pared the dataset; in particular, the factor variable for poverty resulted in a subset of only 10 “high poverty” cities. The results also should be interpreted knowing that some variables in the composite dataset were not from the same year and that one of the “outcome” variables represented an earlier year than our “explanatory” variables (“limited access to healthy food”). Moreover, checking the identified health-related variables for normality revealed that the data were skewed toward the first and fourth quartiles, suggesting the presence of outliers whose impacts are amplified by the small sample size. An additional constraint to the explanatory power of our model is the possible collinearity of our predictor variables, particularly between “race” and “poverty.” The variable for “housing with potential lead risk” is calculated using the lead exposure risk index, which factors in information for poverty and is likely collinear with the explanatory variable for “high poverty.” We are also aware that the demographic and city characteristic variables chosen for our model may not account for all variability in health-related outcomes.

Most importantly, the results should not be interpreted as indicating causal or predictive relationships between explanatory and outcome variables. The nature of the dataset and our analyses may suggest relationships among variables and differences between means.

Notes

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About the Authors

Martha Fedorowicz is a policy analyst in the Research to Action Lab at the Urban Institute, where she works with local government agencies, philanthropic organizations, and nonprofits to deliver technical assistance and translate research into practical tools for policymakers. Before joining Urban, Fedorowicz was a special projects administrator with the City of Lansing's Department of Neighborhoods and Citizen Engagement and a summer policy associate in the City of Detroit's Department of Neighborhoods. A recent graduate of the University of Michigan's Gerald R. Ford School of Public Policy, she specialized in neighborhood development, local government innovation, civic engagement, and housing policy. Fedorowicz has a BA in political science and French from the University of Michigan and served as a youth development Peace Corps volunteer in Morocco from 2012 to 2014.

Joe Schilling is a senior policy associate in the Research to Action Lab and Metropolitan Housing and Communities Policy Center at the Urban Institute. State and local governments are the primary platforms for his applied research, policy translation, and technical assistance work that helps cross-sector leaders adapt and transfer innovative policies and practices. Before coming to Urban, Schilling served as a municipal attorney, a California legislative fellow, the director of community and economic development for the International City/County Management Association, and a professor of urban planning for Virginia Tech. Schilling's applied research on the social determinants of health covers zoning's public health roots and innovative comprehensive planning. He recently finished a three-year fellowship with the Robert Wood Johnson Foundation's Interdisciplinary Research Leaders program in which he conducted a strategic policy health impact assessment of code enforcement and substandard rental housing in Memphis. In 2010, Schilling founded the Vacant Property Research Network, a hub for policy and research translation related to regenerating legacy cities. He holds an LLM in environmental law from the George Washington University and a JD from Hastings College of the Law in San Francisco.

Emily Bramhall is a policy assistant in the Research to Action Lab, where she works on projects in the fields of education, workforce development, and inclusive growth. Before joining Urban, she worked with YouthCAN, a high school summer program focused on promoting leadership and civic engagement in Buffalo, New York. Bramhall received her BS in policy analysis and management from Cornell University.

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