

THE BUILT ENVIRONMENT AND HEALTH

11 Profiles of Neighborhood Transformation

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Prevention Institute is a nonprofit, national center dedicated to improving community health and well-being by building momentum for effective primary prevention. Primary prevention means taking action to build resilience and to prevent problems before they occur. The Institute's work is characterized by a strong commitment to community participation and promotion of equitable health outcomes among all social and economic groups. Since its founding in 1997, the organization has focused on injury and violence prevention, traffic safety, health disparities, nutrition and physical activity, and youth development. This, and other Prevention Institute documents, are available at no cost on our website.

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Foreword

In recent years the public health community has become increasingly aware that the design of the built environment can have a major impact on the health of the public. For example, one may expect more physical activity and healthier diets among persons in communities with convenient, safe walking paths and accessible sources of fresh fruits and vegetables. On the other hand, poorer health indicators may be expected among residents of communities with high crime rates, few parks or walking paths, numerous alcohol and tobacco outlets, and little access to fresh food.

In this monograph, the Prevention Institute has profiled eleven projects in predominantly low-income communities where local residents mobilized public and private resources to make changes in their physical environments to improve the health and quality of life for their citizens. Such changes included building a jogging path around a cemetery, transforming vacant lots into community gardens, reducing the prevalence of nuisance liquor stores, and creating attractive murals on walls where graffiti once reigned.

These case studies will help concerned citizens, urban planners, and public officials examine possibilities for local environmental changes that would improve the health of the residents of their communities.

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THE BUILT ENVIRONMENT AND HEALTH

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Introduction

*This is the last town in the world...
Before this came to be, there were
all the possibilities in the world.
There were all the opportunities for
starting with small things to create a
sweet new history and future.
If only we had seen them.*

BEN OKRI, A PRAYER FOR THE LIVING

There is growing recognition that the built environment—the physical structures and infrastructure of communities—plays a significant role in shaping our health. To a great extent, the connection between environment and health has centered on the results of human exposure to contaminated air, water, and soil. Decisions about land use, zoning, and community design influence the degree of human exposure to toxins, but also have implications for neighborhood access to healthy foods, and the level of safety and attractiveness of neighborhoods for activities such as walking and biking. The designated use, layout, and design of a community's physical structures including its housing, businesses, transportation systems, and recreational resources affect patterns of living (behaviors) that, in turn, influence health.

With support from the Centers for Disease Control and Prevention's National Center for Environmental Health, Prevention Institute crafted 11 profiles about communities across the country

The designated use, layout, and design of a community's physical structures including its housing, businesses, transportation systems, and recreational resources affect patterns of living (behaviors) that, in turn, influence health.

that reveal how the built environment can positively influence the health of community residents. These profiles were written to:

1. Describe the important connections between the built environment and health for practitioners in public health, city and regional planning, community economic development, and other related fields;
2. Support public health practitioners in looking beyond the traditional bounds of the healthcare system to address social and environmental determinants of health;
3. Suggest potential expanded roles for practitioners from diverse fields to promote health-enhancing improvements to the built environment;
4. Highlight a range of opportunities to create community-level change to the built environment through multi-sector partnerships with community residents, businesses, community organizations, and local government; and,
5. Provide concrete examples that demonstrate the importance of the built environment in promoting health.

Environmental factors contribute to disproportionately high incidences of negative health outcomes (cancer, asthma, injuries) in low-income communities which are often also beset with structural and institutional inequities. Disfranchised communities are more likely than wealthy communities to be the sites of hazards and,

BUILT ENVIRONMENT AND HEALTH: OVERVIEW OF PROFILES

The program profiles include: 1) a description of the geographic area and changes that were made; 2) the process required to implement the changes, including leadership and organizational collaboration; 3) any documented impacts, positive and negative; 4) lessons learned, framed as “wisdom from experience;” 5) supporting research that documents the connection between the built environment and health; and 6) next steps for action.

The program profiles tell the following stories:

1. Evergreen Cemetery Jogging Path: In the predominantly Latino, urban area of Boyle Heights, California in East Los Angeles, the Latino Urban Forum and neighborhood residents rally community-wide support to create a safe, 1.5 mile walking/jogging path. Community members previously had no access to parks or open space, but can now get physically active, in their own neighborhood.

2. Partners Through Food: In the Upper Falls community of Rochester, New York, a dynamic collaborative of community members increases access to healthy food by organizing for over five years to bring a full-service supermarket into a community which lacked a single grocery store.

3. Boston Lead-Safe Yard Project: An innovative partnership focusing on Roxbury and Dorchester in Boston, Massachusetts uses affordable techniques to minimize exposure to lead in inner-city yards—a contemporary environmental hazard linked to developmental disabilities and learning delays, particularly among children under six, living in older, urban homes.

4. Gardens for Growing Healthy Communities: A community/academic partnership transforms vacant lots into community gardens in urban neighborhoods throughout Denver, Colorado, creating and documenting new opportunities for physical activity, healthy eating and social connections among community residents, survivors of abuse and homeless people.

5. South Los Angeles Liquor Store Closures: Working to reduce violence and crime in South Los Angeles, California, this community-driven, grassroots effort organizes community residents to close neighborhood liquor stores that negatively impact community health and safety.

6. The Paterno Trivium: Community residents work collaboratively with city government to transform an unsafe traffic intersection into a neighborhood gathering spot and to improve the pedestrian environment on adjacent streets in Hudson Heights, New York City—an ethnically diverse, urban community.

7. The Fenway Alliance: A powerful coalition of 20 well-respected arts, culture and academic institutions revitalizes a cultural district by improving walkability through major infrastructure projects in Boston, Massachusetts. Although focused in a commercial district, their efforts demonstrate innovative roles for large-scale institutions in improving the built environment. Their work is focused on attracting African American and Latino pedestrians from nearby schools and communities.

8. Westside Project: With an eye toward improving the built environment, a collaborative of local government agencies, including the public health department, work to build community support and trust before building pedestrian amenities for residents in Stamford, Connecticut who had become wary after a history of displacement and gentrification.

9. The Seattle Department of Transportation: This citywide department pays special attention to achieving equity across geographic and economic boundaries while working to create an integrated network of pedestrian and bicycle infrastructure that promotes safe physical activity for residents throughout Seattle, Washington.

10. The Wray Health Initiative: In the rural town of Wray, Colorado a coalition builds a neighborhood walking path, basketball court and other features to make fitness fun for people of all ages by soliciting community buy-in and creating social support for activity.

11. Philadelphia Mural Arts Program: Utilizing a grassroots model, this effort engages community members, including ex-gang members, in the creation and painting of murals that improve aesthetics and transform neighborhoods in urban, economically disenfranchised communities throughout Philadelphia, Pennsylvania.

at the same time, often lack the infrastructure to support physical activity and healthy eating. Too many residents live in community environments that promote disease and injury and do not support healthy behaviors that can help them avoid major chronic diseases that result from sedentary lifestyles and poor nutrition (e.g., heart disease and stroke). Many people live in neighborhoods that are over-saturated with alcohol outlets and advertisements, lack grocery stores, have sidewalks in disrepair, have little access to open space, and have dangerously high traffic speeds.

Further, compared to residents of middle-class communities, residents of low-income neighborhoods—struggling with the presence of environmental hazards, crumbling infrastructure, and a lack of economic resources—face even more barriers to overcoming them. They often need to implement change in the face of inadequate transportation, fewer businesses in the neighborhood to support them, institutional barriers to neighborhood investment, and lack of influence within the local government. In addition, people's previous experiences of housing cost increases and gentrification may create a realistic concern that enhancing the neighborhood could result in unintended strain and disruption to the community.

However, the physical environment can promote health directly through access to clean air and water and can influence people's behavior by facilitating health-promoting activities, such as walking, biking, and healthy eating. Changes to the built environment can have a positive impact on many health-related issues, from diabetes and asthma to traffic safety and community violence. In many cases, a change to the built environment will simultaneously impact multiple health conditions. To date, most published examples of improvements to the built environment have occurred in middle- and upper-class communities of predominantly White residents.

A good solution solves multiple problems: Changes to the built environment can have a positive impact on many health-related issues, from diabetes and asthma, to traffic safety and community violence. In many cases, a change to the built environment will simultaneously impact multiple health conditions.

In choosing these 11 profiles, we focus primarily on improvements in communities where the mean resident income is low and where concentrations of African American and Latino residents are high. We highlight how improvements to the built environment can enhance the health and well-being of members of these communities. The examples illustrate how changes to the built environment can be particularly meaningful in communities that have historically

lacked important features such as well-maintained pedestrian infrastructure, services and institutions, or public art. Taken more broadly, the profiles demonstrate how improvements to the built environment have the potential to reduce health disparities.

In compiling these profiles, several themes emerged about how communities are able to overcome challenges and succeed.

- Broad, diverse participation is necessary to mobilize the resources and build the will to make community improvements.
- Efforts to create health-promoting environments provide opportunities to build community resilience and marshal community assets, rather than the more typical focus on risk factors.
- Persistence and innovation are common qualities of the organizers and organizing efforts that successfully brought about improvements to the built environment.
- Engaging communities to focus on changing the policies and practices of local organizations and institutions is part of an effective strategy for improving health and leaving behind lasting changes in neighborhoods.
- Focusing on the built environment fits well with other public health approaches that a) recognize that changing individual behavior involves changing social norms and environmental determinants of health and b) concentrate on the community as the unit of analysis and action.

- While making built environment changes may be necessary, they are not sufficient. As the profiles of the Wray Health Initiative in Wray, Colorado and the Westside Project in Stamford, Connecticut illustrate, improvements to the physical environment are significant components of a multifaceted strategy for promoting health that includes community education, increasing social capital and enhancing social support.

Over the past decade, more and more communities have emphasized the importance of making design decisions in the context of the overall community. The term “smart growth” refers to a land development strategy aimed at managing the growth of a community, minimizing automobile transportation dependence, and improving the efficiency of infrastructure investments. While “smart growth” initiatives have brought attention to the need to manage new growth and development effectively, *Built Environment and Health: 11 Profiles*, calls attention to the value of neighborhood-level changes within existing structures. Many low-income urban environments suffering from disinvestments and decay already have the skeleton of a walkable community and possess great potential. Practices as simple and routine as road repavement are opportunities for neighborhood enhancement. One road at a time, more space can be created for bicycles and pedestrians, and routes can be narrowed and altered to promote “traffic calming,” (i.e., decreasing vehicular speed, and increasing safety). These profiles demonstrate that small and incremental changes are opportunities to design solutions that suit unique neighborhood environments and are significant contributions toward improving health and quality of life locally. These changes offer substantial enhancements for the affected residents, and build momentum for further improvements.

In identifying profiles, a key goal was to highlight initiatives that clearly demonstrate linkages between environmental changes and changes in health behaviors

and outcomes. However, such projects are few and our selected efforts are not thoroughly evaluated. Documenting the health impact of environmental change efforts remains a challenge for a host of reasons. Communities generally are not collecting the quality and quantity of data needed to demonstrate impact. Some built environment initiatives are not explicitly designed with health outcomes in mind, and therefore health-related information may not be collected. Furthermore, multi-year surveillance of changes in population health status is often beyond the scale or resource capacity of localities. Therefore, to improve the evaluation of future initiatives it may be appropriate for local evaluation to focus on documenting changes in behavior. For example, a community can assess changes in rates of walking among residents in a manner that can be coordinated with national efforts examining changes in the rate of health conditions such as obesity and heart disease.

In cases where documenting behavior change is beyond an initiative’s scope or capacity, evaluation can focus on documenting the environmental change that occurred. With nationally supported evidence demonstrating that a specific environmental change at the community level yields a positive health outcome, communities can focus on implementing and documenting the particular environmental change, rather than attempt to document the expected behavior change. Toward this end, further investment in thorough case studies to evaluate the impact of some interventions, like those profiled in this report, may be warranted.

The powerful influence of the built environment on health suggests that public health practitioners should be involved in planning and policy decisions related to land use, zoning and community design. Health practitioners can serve an essential role in collaborating with other professionals and working alongside neighborhood residents to create and promote healthy communities. Their participation becomes imperative as the conviction grows that addressing the social and

The powerful influence of the built environment on health suggests that public health practitioners should be involved in planning and policy decisions related to land use, zoning and community design.

physical environment is an essential element of a strategy to encourage healthy behaviors. Thus, a new role for public health leadership is emerging. In this emerging role, practitioners need to engage in three principal areas of action. The first is to assess the health impact of land use and community design options before decisions are made as well as after improvements are implemented. The second is to catalyze and facilitate inclusive partnerships with membership that stretches far beyond traditional health fields to plan new structures and redesign existing ones. Third, public health practitioners need to participate in policy-making on issues related to the built environment to ensure protection from toxins, access to healthy food outlets, places to walk and recreate, and other health-promoting environments.

While Prevention Institute was successful at documenting compelling profiles, we also found critical needs and unfulfilled opportunities in communities throughout the country where health and quality of life could be improved through changes to the built environment. Our hope is that the profiles that follow will stimulate and inspire practitioners from multiple fields and sectors to partner with community residents, design solutions, and take action to improve the built environment for the health and well-being of all.

BOSTON, MASSACHUSETTS

Boston Lead-Safe Yard Project uses affordable techniques to mitigate exposure to lead in inner-city yards

In the heart of Boston's "lead belt," children playing in their own yards are unwittingly exposed to lead in amounts that could result in developmental delays, learning disabilities, or behavioral disorders. While achievements in the removal of lead from paint and gasoline have been an extraordinary public health success story, lead-contaminated soil that surrounds older homes remains a significant source of lead exposure that has not yet received widespread attention. A pilot project of the US Environmental Protection Agency's (EPA) Environmental Monitoring for Public Access and Community Tracking (EMPACT) program is working to change that with a project called the Boston Lead-Safe Yard Project (LSYP).



LEAD EXPOSURE FROM SOIL REMAINS A PROBLEM FOR RESIDENTS OF BOSTON'S OLDER HOMES.

"Outreach was difficult at first. We searched for unique ways such as a model yard, signs and advertising."

The Boston LSYP team uses low-cost landscaping techniques to reduce lead contamination in the Boston metropolitan area. In addition, the project informs residents about the risks of lead exposure among children and provides timely data on lead levels in soil.

The Boston LSYP has raised awareness about lead dangers and helps individuals, community organizers, and local government mitigate the risks of lead poisoning from residential soil in neighboring communities.

THE PLACE

Boston properties typically have soil lead levels well in excess of EPA standards, both in play areas and along house foundations. Elevated lead levels in soil result primarily from the chipping and peeling of exterior lead paint and also from leaded gasoline. Although many Boston houses have been de-leaded, few yards have undergone soil lead abatement for several reasons: the cost of full-scale removal of soil has historically been prohibitive to both families and the city (\$6,000 to \$10,000 for a typical triple-decker property); public funding has not been available; and the dangers of elevated lead levels in soil are not widely recognized.

When EMPACT program investigators went looking for a spot to launch the Lead-Safe Yard Project, two areas in Boston's "lead belt" stood out. The initial target community selected for the pilot project was a several block area in the Bowdoin Street neighborhood, consisting of approximately 150 mostly older, wood-

framed houses in the North Dorchester section of Boston. Efforts later expanded into Roxbury, another high-risk, low-income area that also contained a lot of old homes whose chipping paint contributed to unhealthy lead levels in the soil of surrounding yards. Both neighborhoods were chosen because they had:

- high incidences of lead poisoning,
- large concentrations of older wood homes (most built before 1978) that had been painted with lead-based paint,
- a large low-income, multi-racial and immigrant population,
- contiguous yards that increased the potential for neighborhood-wide impact,
- a local community environmental health organization, and
- a history of established neighborhood environmental activities upon which the EMPACT project could build.

THE PROJECT

It is well established that exposure to lead during early developmental years is one of the most significant environmental health concerns for inner-city youth,¹ especially for those who live in poorly maintained housing in older urban neighborhoods. According to the Centers for Disease Control and Prevention, one in every four to six children may have elevated lead levels in inner cities, based on current blood lead data. The link between learning disabilities and elevated blood lead levels in preschool children is also well documented, particularly for those under the age of six. Lead poisoning is more prevalent in low-income, minority, and immigrant communities and is compounded by additional environmental hazards such as indoor air contaminants, deteriorating infrastructures, housing demolition, abandoned housing, congested roadways, industrial land uses, and vacant land.

H. Patricia Hynes, a professor of Environmental Health at Boston

While achievements in the removal of lead from paint and gasoline have been an extraordinary public health success story, lead-contaminated soil that surrounds older homes remains a significant source of lead exposure.



BOSTON'S LEAD-SAFE YARD PROJECT USED LOW-COST TECHNIQUES LIKE GROUNDCOVER TO REDUCE RESIDENTIAL LEAD EXPOSURE.

University, School of Public Health and the co-director of the Boston LYSP team, is committed to using community-based participatory approaches to eliminating the hazardous conditions related to lead that disproportionately exist in older, low-income housing. The team's research is action-oriented, pairing the root of the problem with solutions that are practical and applicable for community members. The Boston LSYP team documents the presence of serious environmental lead contamination in a timely fashion and presents solutions that the community can use. When project investigators found that high levels of lead in soil and heavily traveled roadways are a significant contributor to lead exposure and poisoning among Boston area residents, they wanted to develop affordable ways to mitigate lead exposure to improve the health and well-being of community members. In conjunction with residents

and community-based institutions, the Boston LSYP developed a series of low-cost, low-technology measures to reduce exposure to lead contaminated soil.

From 1998 to 2001, the project conducted a multi-phase lead-safe yard intervention which included: a) outreach to, and education of, homeowners, b) soil analysis to establish baseline lead levels, c)



STONE OR BRICK PATHS ARE AN IMPORTANT EPA-RECOMMENDED LEAD ABATEMENT STRATEGY.

development and application of cost-effective landscaping measures to reduce exposure to high lead soil, d) communication with homeowners about design decisions and long-term maintenance, and e) dissemination of project methods to community agencies, local government, and others to encourage program replication.

“Outreach was difficult at first,” said Hynes. “It was hard to attract families into the program. We searched for unique ways such as a model yard, signs, and advertising.” Community partners were hired to conduct outreach to neighbors and community residents through mass mailings, phone calls, door-to-door solicitations, and distribution of lead-safe yard literature at community events. Education materials included culturally appropriate printed materials, a video produced by the Boston Childhood Lead Poisoning Prevention Program, and a quiz to test parents’ knowledge about lead.

Once participants agreed to enroll in the project, outreach staff provided education and coordinated the soil analysis with project team members. A chemist from EPA’s Region 1 Lab and a certified industrial hygienist from the Bowdoin Street Community Health Center in Dorchester analyzed more than 100 yards, testing soil in

From chemists to contractors, the Boston LSYP rallied a range of diverse partners around a singular cause: reducing the risk of lead contamination.

areas most likely to present sources of lead contamination. A member of the landscape crew then presented the results to homeowners and together they developed a treatment plan tailored to each particular home. A standardized questionnaire documented how the yard was being used, household characteristics, and availability of the homeowner. Landscapers incorporated this information into their recommendations for treatment, creating a “blueprint” for each yard. Homeowners participated in every part of the process.

Using EPA recommendations for residential lead-contaminated soil abatement, the project developed a suite of options that emphasized affordability and replicability. The most common soil remediation techniques included installation of wood framed boxes (to separate food items and play areas from contaminated soil), relocation of fruit/vegetable gardens and children’s play areas, laying stone paths, planting grass, applying landscape cloth, or bringing in groundcover (such as mulches or wood chips to fill-in and reduce direct exposure to leaded soil).

THE PEOPLE

Diverse Partners Collaborate to Build Healthy Environments

From chemists to contractors, the Boston LSYP rallied diverse partners around a single cause: reducing the risk of lead contamination. The project brought together community residents and organizations, local businesses, a neighborhood health center, the Department of Public Health, a housing agency, Boston University School of Public Health, and EPA Region 1.

While the Boston University School of Public Health oversaw outreach and education and coordinated the development of the lead removal toolkit, a chemist from EPA’s New England Regional Laboratory conducted soil analysis. The Dudley Street Neighborhood Initiative and local landscape contractors—including Garden Futures and Dorchester Gardenlands Preserve

—participated in outreach and yard renovation, and the Bowdoin Street Community Health Center provided a certified industrial hygienist to assist in residential soil analysis. As the project progressed, it expanded to include two city agencies: Boston’s Childhood Lead Poisoning Prevention Program and Lead-Safe Boston, and the National Center for Healthy Housing, which conducted the evaluation in the project’s final phase. Engaging a wide variety of partners lent the project a great deal of organizational support and allowed the work to become institutionalized within city health and housing agencies once the pilot phase ended.

The EPA’s EMPACT program provided the funding, while local businesses provided materials donations.

This project has successfully reduced one of the most significant environmental health concerns for inner-city youth. After one year, soil treatments continued to prevent exposure to leaded soil in all properties.

THE RESULTS

Healthy Change in Local Environments

Between the summer of 1998 and the fall of 2001, the Boston LSYP completed 61 lead-safe yards, the city health department treated an additional six yards, and Lead-Safe Boston completed 22 lead-safe yards. By decreasing children’s exposure to lead, this project has successfully reduced one of the most significant environmental health concerns for inner-city youth. After one year, soil treatments continued to prevent exposure to leaded soil in the properties concerned, according to an evaluation managed by the National Center for Healthy Housing. All three measures of treatment effectiveness (surface measurements, dust lead levels on exterior floor mats, and floor dust lead levels) showed statistically significant reductions in lead levels for properties enrolled in 2000.

The project demonstrated several important results.

1) Lead contaminated soil can be mitigated at a fraction of the cost of conventional methods in ways that increase the ability of residents, community health centers, and others to have a positive impact on their neighborhoods.

2) Government agencies, universities, residents, and community-based organizations can work together effectively to reduce lead exposures from soil.

3) A lead-safe yard program can be replicated and institutionalized by municipal home de-leading programs and other community organizations.

Removing lead from inner-city soil or reducing exposure to contaminated soil has typically been too expensive or technologically challenging for residents to undertake. But the Boston LSYP has demonstrated techniques that low-income households can utilize at low costs. To assist other groups to replicate their efforts, project leaders created a toolbox, available at: www.epa.gov/region01/leadsafe/tool2.html.

The evaluation of this project reflects what health improvements research has demonstrated in other regions. For example, a major EPA intervention study found that when soil is a significant source of lead in a child’s environment, lead abatement in soil will result in reduced exposure and consequently a reduction in blood lead levels.² The EPA research team found that a soil reduction of 2,060 ppm was associated with a 2.25 to 2.70 µg/dl decline in blood lead levels.³ Other research estimating that interior house dust is comprised of anywhere from 30% to 50% of soil dust further reveals the health importance of soil lead abatement programs.⁴

By tackling lead contamination yard by yard, the Boston LSYP has made significant strides toward promoting community health within the city’s “lead belt,” and has provided a model other communities can follow.

WISDOM FROM EXPERIENCE

Cost was a crucial factor in determining yard treatment recommendations. For example, off-site removal and disposal of soil was not feasible because of high costs and logistical barriers. Unfortunately, despite creative treatment solutions, the project operated over budget. Even with donations of free gravel, wood



MULCHES AND GROUND COVER REDUCE EXPOSURE TO LEADED SOIL IN RESIDENTIAL YARDS.

chips, and compost by a local company, the average per yard cost far exceeded the project's goal of \$750, and cost approximately \$2,100 per yard. The breakdown of costs included \$300 for materials, and \$1,800 for landscape and construction labor. Project management added about \$900 per yard to the overall cost. However, despite these cost issues and the fact that the team was not able to meet their ambitious goal of \$750 per yard, the personal, social and economic costs of the damage from lead poisoning far exceed the expenditures. Not only is the project ensuring the health and safety of current community members, but it is protecting that of future members as well, saving money across the board.

Hynes shared some of her observations about the project: "Hiring community partners to do the outreach made for project success. We trained community partners using slide shows to build their skills in presenting the project to residents. They would also give talks about the program in community forums. Because they were in contact with the community, our partners were critical to planning, outreach, and evaluation of the project. This relationship built the skills of community partners and also enhanced follow-up and communication with community members. We developed EMPACT materials that document the process, provide a "how-to" workbook and describe all

of the inexpensive ways to reduce lead exposure in urban yards. We believe these products will provide others interested in implementing a similar effort with a template and a road map for success."

LOOKING AHEAD

Building upon the success of their creative, relatively low-cost, low-technology treatment approach, the Boston LSYP is looking to expand its array of treatment options. The project plans to conduct feasibility assessments of other strategies such as installing turf, planting species of plants that take up lead in open sunny areas, or in portable growing bins in more shaded areas. Project stakeholders would also like to explore the use of central, municipally-managed treatment sites to treat and recycle contaminated soil, thereby granting urban communities more permanent solutions.

Now that they have proven that affordable remediation techniques can reduce urban lead exposure, project members are working to ensure that their successes will translate into increased efforts by governments, community organizations, and private enterprises to apply these effective lead-safe yard techniques in neighborhoods across the country.

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ENDNOTES

- 1 Centers for Disease Control and Prevention, 1997. *Screening Young Children for Lead Poisoning: Guidance for State and Local Public Health Officials*. Atlanta, GA.
- 2 Hynes, HP et al., 2001. “Dorchester Lead-Safe Yard Project. A Pilot Program to Demonstrate Low-Cost, On-Site Techniques to Reduce Exposure to Lead—Contaminated Soil,” *Journal of Urban Health* 78(1), p.199-211.
- 3 US Environmental Protection Agency, 1993. *Integrated Report of the Urban Soil Lead Abatement Demonstration Project*. Washington, D.C.
- 4 Aschengrau, A. et al., 1994. “The Impact of Soil Lead Abatement on Urban Children’s Blood Lead Levels: Phase II Results from Boston Lead-In-Soil Demonstration Project,” *Environmental Research* 67, p. 125-148.
- 5 Calabrese et al, 1992. “What Proportion of Household Dust is Derived from Outdoor Soil?” *Journal of Soil Contamination* 1, p. 253-263.

This is one in a series of 11 profiles that reveal how improvements to the built environment can positively influence the health of community residents. The examples illustrate how changes to the built environment can be particularly meaningful in communities that have historically lacked important features such as pedestrian infrastructure, services and institutions, or public art. Taken more broadly, the profiles demonstrate how improvements to the built environment have the potential to reduce health disparities.

The profiles were written and produced by Prevention Institute. Funding and guidance were provided by the Centers for Disease Control and Prevention’s National Center for Environmental Health. It is our hope that these profiles will stimulate and inspire partnerships between community residents and practitioners from multiple fields and sectors to design solutions and take action to improve the built environment for the health and well-being of all.