Bringing Public Health into Urban Revitalization: Workshop Summary

DETAILS

98 pages | 6 x 9 | PAPERBACK
ISBN 978-0-309-37995-3 | DOI: 10.17226/21831

AUTHORS

Robert Pool and Kathleen Stratton, Rapporteurs; Roundtable on Environmental Health Sciences, Research, and Medicine; Board on Population Health and Public Health Practice; Institute of Medicine; National Academies of Sciences, Engineering, and Medicine

Bringing Public Health into Urban Revitalization

Workshop Summary

Robert Pool and Kathleen Stratton, *Rapporteurs*

Roundtable on Environmental Health Sciences, Research, and Medicine

Board on Population Health and Public Health Practice

Institute of Medicine

The National Academies of
SCIENCES • ENGINEERING • MEDICINE

THE NATIONAL ACADEMIES PRESS
Washington, DC
www.nap.edu

THE NATIONAL ACADEMIES PRESS 500 Fifth Street, NW Washington, DC 20001

This activity was supported by contracts between the National Academy of Sciences and Colgate-Palmolive Company, ExxonMobil Foundation, The Kresge Foundation, the National Institute of Environmental Health Sciences, and Royal Dutch Shell. Any opinions, findings, conclusions, or recommendations expressed in this publication do not necessarily reflect the views of any organization or agency that provided support for the project.

International Standard Book Number-13: 978-0-309-37995-3
International Standard Book Number-10: 0-309-37995-4

Additional copies of this report are available from the National Academies Press, 500 Fifth Street, NW, Keck 360, Washington, DC 20001; (800) 624-6242 or (202) 334-3313; http://www.nap.edu.

Printed in the United States of America

Cover design: Anna Martin.

Suggested citation: National Academies of Sciences, Engineering, and Medicine. 2015. *Bringing public health into urban revitalization: Workshop summary.* Washington, DC: The National Academies Press.

The National Academies of
SCIENCES • ENGINEERING • MEDICINE

The **National Academy of Sciences** was established in 1863 by an Act of Congress, signed by President Lincoln, as a private, nongovernmental institution to advise the nation on issues related to science and technology. Members are elected by their peers for outstanding contributions to research. Dr. Ralph J. Cicerone is president.

The **National Academy of Engineering** was established in 1964 under the charter of the National Academy of Sciences to bring the practices of engineering to advising the nation. Members are elected by their peers for extraordinary contributions to engineering. Dr. C. D. Mote, Jr., is president.

The **National Academy of Medicine** (formerly the Institute of Medicine) was established in 1970 under the charter of the National Academy of Sciences to advise the nation on medical and health issues. Members are elected by their peers for distinguished contributions to medicine and health. Dr. Victor J. Dzau is president.

The three Academies work together as the **National Academies of Sciences, Engineering, and Medicine** to provide independent, objective analysis and advice to the nation and conduct other activities to solve complex problems and inform public policy decisions. The Academies also encourage education and research, recognize outstanding contributions to knowledge, and increase public understanding in matters of science, engineering, and medicine.

Learn more about the National Academies of Sciences, Engineering, and Medicine at **www.national-academies.org**.

.

PLANNING COMMITTEE FOR THE WORKSHOP ON BRINGING PUBLIC HEALTH INTO URBAN REVITALIZATION[1]

DAVID D. FUKUZAWA, The Kresge Foundation, Troy, MI
LYNN R. GOLDMAN, George Washington University, Washington, DC
RICHARD J. JACKSON, University of California, Los Angeles
JOHN D. SPENGLER, Harvard School of Public Health, Boston, MA

[1] Institute of Medicine planning committees are solely responsible for organizing the workshop, identifying topics, and choosing speakers. The responsibility for the published workshop summary rests with the workshop rapporteurs and the institution.

ROUNDTABLE ON ENVIRONMENTAL HEALTH SCIENCES, RESEARCH, AND MEDICINE[1]

FRANK LOY (*Chair*), Washington, DC
LYNN R. GOLDMAN (*Vice-Chair*), George Washington University, Washington, DC
HENRY A. ANDERSON, Wisconsin Division of Public Health, Madison
JOHN M. BALBUS, National Institute of Environmental Health Sciences, Bethesda, MD
JAMES K. BARTRAM, University of North Carolina at Chapel Hill
FAIYAZ BHOJANI, Royal Dutch Shell, The Hague, Netherlands
LINDA S. BIRNBAUM, National Institute of Environmental Health Sciences, Research Triangle Park, NC
LUZ CLAUDIO, Mount Sinai School of Medicine, New York, NY
DENNIS J. DEVLIN, ExxonMobil Corporation, Irving, TX
RICHARD A. FENSKE, University of Washington, Seattle
DAVID D. FUKUZAWA, The Kresge Foundation, Troy, MI
LUIZ A. GALVÃO, Pan American Health Organization, Washington, DC
BERNARD D. GOLDSTEIN, University of Pittsburgh, PA
RICHARD J. JACKSON, University of California, Los Angeles
SUZETTE M. KIMBALL, U.S. Geological Survey, Reston, VA
JAY LEMERY, University of Colorado Denver
ANDREW MAGUIRE, Environmental Defense Fund, Washington, DC
LINDA A. MCCAULEY, Emory University, Atlanta, GA
AL MCGARTLAND, U.S. Environmental Protection Agency, Washington, DC
DAVID M. MICHAELS, Occupational Safety and Health Administration, Washington, DC
CANICE NOLAN, European Commission, Brussels, Belgium
CHRISTOPHER J. PORTIER, Centers for Disease Control and Prevention, Atlanta, GA
PAUL SANDIFER, National Oceanic and Atmospheric Administration, Charleston, SC
SUSAN L. SANTOS, Rutgers School of Public Health, Piscataway, NJ

[1] Institute of Medicine forums and roundtables do not issue, review, or approve individual documents. The responsibility for the published workshop summary rests with the workshop rapporteurs and the institution.

JOHN D. SPENGLER, Harvard School of Public Health, Boston, MA
G. DAVID TILMAN, University of Minnesota, St. Paul
PATRICIA VERDUIN, Colgate-Palmolive Company, Piscataway, NJ
NSEDU OBOT WITHERSPOON, Children's Environmental Health Network, Washington, DC
HAROLD ZENICK, U.S. Environmental Protection Agency, Research Triangle Park, NC

IOM Staff

KATHLEEN STRATTON, Study Director
ERIN RUSCH, Associate Program Officer (*until May 8, 2015*)
HOPE HARE, Administrative Assistant
ANNA MARTIN, Senior Project Assistant
ROSE MARIE MARTINEZ, Director, Board on Population Health and Public Health Practice

Reviewers

This workshop summary has been reviewed in draft form by persons chosen for their diverse perspectives and technical expertise. The purpose of this independent review is to provide candid and critical comments that will assist the institution in making its published summary as sound as possible and to ensure that the summary meets institutional standards for objectivity, evidence, and responsiveness to the study charge. The review comments and draft manuscript remain confidential to protect the integrity of the process. We wish to thank the following individuals for their review of this workshop summary:

Dennis Devlin, ExxonMobil Corporation
David Fukuzawa, The Kresge Foundation
Greg Kats, Capital E
Al McGartland, U.S. Environmental Protection Agency

Although the reviewers listed above have provided many constructive comments and suggestions, they did not see the final draft of the workshop summary before its release. The review of this summary was overseen by **Joanna Dwyer,** Tufts Medical Center. She was responsible for making certain that an independent examination of this workshop summary was carried out in accordance with institutional procedures and that all review comments were carefully considered. Responsibility for the final content of this summary rests entirely with the rapporteurs and the institution.

Contents

1

Introduction[1]

On November 10, 2014, the National Academies of Sciences, Engineering, and Medicine's Roundtable on Environmental Health Sciences, Research, and Medicine held a workshop titled Bringing Public Health into Urban Revitalization. This workshop represents the Roundtable members' long-standing interest in and growing appreciation of the ways in which the urban environment, conceived broadly from factors such as air quality and walkability to factors such as access to fresh foods and social support systems, can affect health. Individuals and organizations are investigating and experimenting with ways to improve public health by influencing such factors in cities across the United States. This can be a broad, multidisciplinary undertaking involving not only public health professionals but also experts from such areas as architecture, business, economics, marketing, sociology and social work, and urban design.

A particularly valuable opportunity to improve public health arises when an urban area is being redesigned and rebuilt following some type of serious disruption, whether it is caused by a sudden physical event, such as a hurricane or earthquake, or steady economic and social decline that may have occurred over decades. The purpose of the workshop was to explore the various opportunities to reimagine the built environment in a city and to increase the role of health promotion and protection during the process of urban revitalization. The workshop focused on case studies from three U.S. cities: Washington, DC; Detroit, Michigan; and New York City. Each of these urban areas recently engaged in rebuilding and revitalization efforts,

[1] The planning committee's role was limited to planning the workshop, and the workshop summary has been prepared by the workshop rapporteurs as a factual summary of what occurred at the workshop. Statements, recommendations, and opinions expressed are those of the individual presenters and participants and are not necessarily endorsed or verified by the National Academies of Sciences, Engineering, and Medicine, and they should not be construed as reflecting any group consensus.

the impetus for which was unique to the specific city. These three cities face not only similar but also different challenges, and the rebuilding and revitalization efforts are in different stages of implementation. By examining and comparing the role of public health in these different revitalization efforts, it is possible to gain a broad sense of where the various challenges and opportunities lie in this area. The workshop statement of task is provided in Box 1-1.

ORGANIZATION OF THE SUMMARY

The following is a summary and synthesis of the presentations and discussions that took place during the workshop. When reading the summary, it is important to keep in mind that the opinions expressed and any recommendations made are those of the individual speakers themselves and do not represent the position of the Institute of Medicine or the National Academies of Sciences, Engineering and Medicine. The purpose of the Roundtable on Environmental Health Sciences, Research, and Medicine is to provide a mechanism for interested parties to meet and discuss sensitive and difficult environmental issues in a neutral setting. The Roundtable fosters dialogue about these issues, but it does not provide recommendations or try to find a consensus.

BOX 1-1
Statement of Task

An ad hoc committee will plan and conduct a 1-day, public workshop exploring issues related to the redesign of major American cities. The workshop will use two to four case studies of cities in decline currently undergoing major revitalization or reimagining of the built environment. The workshop will explore different causes of urban decay, the environmental health impact of that decay, and potential strategies to improve the built environment to protect and promote human health. The committee will identify specific topics to be addressed, develop the agenda, select and invite speakers and other participants, and moderate the discussions. An individually authored full-length workshop summary and a brief workshop summary will be prepared by a designated rapporteur in accordance with institutional guidelines.

The organization of this summary follows the structure of the workshop agenda. Chapter 2 includes the presentations regarding the efforts in Washington, DC, to improve health by making Washington, DC, a green city. Chapter 3 addresses the challenges faced by Detroit. Chapter 4 includes a presentation on Rebuild by Design, focusing on a winning project on rebuilding Hunts Point in New York City after Hurricane Sandy. Chapter 5 includes a discussion of cross-cutting issues. The workshop presenters included many photos and one video during the day. The interested reader is encouraged to access these via the Roundtable website.[2] The workshop agenda is found in Appendix A, and biographical sketches of the workshop speakers are included in Appendix B.

OVERVIEW: A TALE OF THREE CITIES

Lynn Goldman, dean of the Milken Institute School of Public Health at George Washington University, opened the workshop by noting that for many decades many U.S. cities, particularly older industrial cities, have been undergoing population loss but that in recent years both younger and older people have become interested in living in cities again. She noted that young people, many of whom grew up in suburbs, prefer not to live far from where they work and want to be in neighborhoods that are walkable and bikable and that offer places to congregate and interact with people from different cultures and backgrounds. At the same time, older people have become more interested in living in cities, which has led to a global movement of cities becoming more aging friendly. She stated that there is a growing recognition that living in the suburbs in not necessarily the best option for older people in terms of access to services and social environments and the opportunity to move on to second careers or new lives.

There is currently much focus on urban living and urban environments, which provides an opportunity to create healthier urban communities. That is the context in which the workshop should be seen, she said. The three cities highlighted during the workshop—Washington, DC, Detroit, and New York City—all went through rebuilding efforts that were done quite differently. Goldman noted that the workshop presenters were asked to outline the unique approaches and ideas that were utilized, the creative energy that was stimulated, and the many opportunities for public health

[2] See http://iom.nationalacademies.org/Activities/Environment/EnvironmentalHealthRT/2014-NOV-10.aspx.

that were present in the context of urban revitalization. She also suggested that speakers devote particular attention to efforts taken to ensure the health of children and minorities, to increase the role of public health departments and health systems, to increase a sense of community, and to utilize green technologies to increase livability and sustainability.

2

Utilizing Green Technologies in Washington, DC

The workshop's first session focused on case studies from Washington, DC. Lynn Goldman, dean of the Milken Institute School of Public Health at George Washington University, introduced this session by noting that, as someone who works in Washington, DC, she has been struck by how easy it is to get around without an automobile, how convenient public transportation has become, and how every year it becomes easier to walk or to bicycle through the city. At the same time, she said, she has been struck by the huge disparities between those in the city who are very educated and very well off and those who have less education, lower incomes, and a harder time accessing the city's opportunities for improving one's health. She stated that Washington, DC, offers a number of important opportunities for improving public health and that it is those opportunities that the session's two speakers would be addressing.

GREEN BUILDINGS

The session's first speaker was Gregory Kats, president of Capital E, a national clean energy advisory and venture capital firm. He was previously the director of financing for energy efficiency and renewable energy at the U.S. Department of Energy; serves on the Washington, DC, mayor's Green Ribbon Task Force, guiding the greening of Washington, DC; and chairs the Federal Council, guiding the greening of federal buildings. He spoke about green buildings and the role that they could play in Washington, DC.

In the coming decades, cities will play a major role in determining not only the quality of people's day-to-day lives but also the long-term quality of the global environment, Kats said. Cities are major sources of the carbon dioxide that is driving global warming, for instance, and cities have historically been far from environmentally friendly in many different ways, but it does not have to be that way.

Kats described results synthesized from his book *Greening Our Built World: Costs, Benefits, and Strategies*, which examined the cost-effectiveness of green buildings (buildings designed to use fewer resources and support the health of inhabitants) through detailed building surveys and findings from other studies (Kats et al., 2010). The sponsors for his research include some groups not normally associated with this type of work, including the American Institute of Architects, the National Association of Realtors, and the National Association of State Energy Officials. He noted that no environmental groups sponsor his research to avoid it being tagged as something with a specific environmental objective.

In his research, the benefit–cost ratio of constructing a green building versus a traditional building is about 2.5 to 1, just on the basis of utility bills. That is, for every additional $1 in cost, the green building will return $2.50 in cost savings over 20 years, on a net-present-value basis. Green building design[1] also has a number of health benefits, in the sense that people living and working in them tend to be healthier in various ways, Kats said, but these benefits are generally difficult to quantify because of a paucity of evidence on the health and productivity benefits specifically attributed to green building design. He showed some results from one study carried out by the Seattle Housing Authority comparing the health of children and adolescents moved into a building that the authority worked to make healthy (naming it a "breathe-easy home") with the health of those not moved into a different home. Over an average 14-day period, those living in the new home for 1 year had 12.4 symptom-free days, whereas those living in the old home had only 8.6[2] symptom-free days. The group in the new home had an average of 20.6 urgent clinical care visits over the course of 1 year, or just one-third the 61.8 urgent clinical care visits of those living in the old home (Kats et al., 2010). In other words, the difference was dramatic.

In carrying out its research on green schools, his group was able to quantify various benefits for the students in such schools, as reported in

[1] In this context, green building design refers to construction certified by the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) rating system or another similar rating system. LEED is a trademarked certification program used in 135 countries that guides the design, construction, operation, and maintenance of buildings that save money and resources, positively impact the health of their occupants, and promote renewable clean energy. For more information, see http://www.usgbc.org/leed (accessed March 19, 2015).

[2] Although the slide showed 7.6 days, the data presented in the literature indicate 8.6 days (Takaro et al., 2011).

Greening America's Schools: Costs and Benefits (Kats, 2006). These benefits included a 3 percent increase in learning ability, a 1.4 percent increase in lifetime annual earnings, a 25 percent decrease in asthma incidence, a 15 percent decrease in the numbers of cases of colds and flu, and a 3 percent reduction in teacher turnover (Kats, 2006). Although the effects according to the changes in percentages are relatively small, they result in large benefit–cost ratios because employee costs are significantly higher than building costs over the lifetime of a school. Moreover, when health and productivity benefits are added, the benefit–cost ratio of doing green buildings is substantially higher than the energy and water benefits alone (Kats et al., 2010).

Kats next showed data from a study by the World Green Building Council that looked at the price of green buildings versus the price of conventional buildings over time in various countries in Asia, Europe, and North America. The data demonstrated that buyers were consistently paying a premium for green buildings (World Green Building Council, 2013). "So the market is really responding to the choice between a building that is designed to be deliberately healthy and efficient versus the conventional design strategy, which is to barely meet code at lowest cost," he said.

When the U.S. real estate market went into recession in 2008, Kats noted that there was some question whether green buildings would continue to thrive or whether people would choose to go back to basic building design and see green design as a superfluous option. "It turned out to not be the case," he said. "The growth of green buildings has been very dramatic." In 2012, 41 percent of nonresidential construction in the United States was certified by Leadership in Energy and Environmental Design (LEED), whereas a decade ago only about 2 percent of nonresidential construction was LEED certified (USGBC, 2015). The fact that the design of new nonresidential buildings has moved so decisively to green design has tremendous positive implications for health, he said.

Comparison of Cool Roofs, Green Roofs, and Solar-Paneled Roofs

Switching gears to his work in the District of Columbia, Kats said that he and his colleagues are collaborating with the District of Columbia Department of General Services in a study of the costs and benefits of cool roofs, green roofs, and solar-paneled roofs.[3] The goal is to develop a

[3] Green roofs (sometime referred to as "vegetated roofs") are covered with soil (ranging in depth from 2 to 3 inches to 6 inches or deeper) and a variety of plants to reduce storm water runoff and promote cleaner air. Cool roofs use a white surface

rigorous and broadly applicable cost–benefit model and tool kit that will help builders make decisions about these different building options.

Determining the benefits of these green options can be complex, Kats said. Cool roofs, for example, have a variety of potential benefits, both direct and indirect. Because a cool roof reflects a large percentage of sunlight back into space, it prevents the building from heating up in summer and also helps reduce the heat island effect, which causes urban areas to be hotter than the surrounding areas. Keeping urban areas cooler reduces the amount of ozone buildup, which in turn reduces some negative health effects. It also helps decrease the rates of heat-related mortality in the city during the hot summer months.

Green roofs retain water and release it gradually through the presence of plants growing on the roof. They also help reduce the heat island effect, reduce the level of ozone, and reduce heat-related mortality, but in addition, they help reduce storm water management costs.

The placement of solar cells on roofs to produce power helps reduce the negative effects of generating power by burning fossil fuels—in particular, by reducing the particulate matter, heavy metals, and greenhouse gases that result from the burning of fossil fuels.

Kats said that he and his group have worked very closely with the U.S. Environmental Protection Agency (EPA) to map out the health implications of these various design choices, and they are now able to point to quantifiable benefits of green buildings. For instance, particulate matter—in particular, fine particles with a diameter of 2.5 micrometers or less ($PM_{2.5}$)—is known to have major health effects, such as increasing the rates of asthma, lung cancer, cardiovascular disease, various respiratory diseases, and premature mortality. It turns out that while green roofs help decrease $PM_{2.5}$ concentrations, they accomplish this mainly by decreasing building temperatures and thus lowering energy use, Kats said.

The model also takes into account the benefits accrued by green roofs from the reduced amount of heat-related morbidity and mortality. The effects of heat on health range from the mild (discomfort, skin eruptions, heat fatigue) to the moderate (heat cramps, heat exhaustion) and the severe (heat stroke, conditions requiring emergency medical care) and even death. "In Europe, a decade ago, there were 50,000 premature deaths in one severe heat incident during one summer," Kats said. He added that the greatest

---

material to increase light reflection, reduce heat absorption, and cool the building interior. Solar roofs are covered with photovoltaic array solar power installations, which can produce energy for the building (Environmental and Energy Study Institute, 2012).

effects of heat are generally seen on the top floors of low-income apartment buildings with dark, flat roofs.

The model that Kats and his colleagues developed provides estimates of the costs (in dollars) and benefits associated with the three roof choices as installed on buildings in Washington, DC. The most expensive roof to install and maintain is the green roof, as it requires people to plant and take care of an expanse of greenery; cool roofs are not significantly more expensive to install and maintain than conventional roofs. All three types of roofs have energy benefits—energy savings by keeping a building cooler for cool and green roofs and energy generation from solar-paneled roofs—and in the case of cool roofs and the solar-paneled roof, these benefits already outweigh the costs, even when no other benefits are taken into account. A major benefit of the green roof is the savings associated with storm water accommodation, and the savings are enough to more than balance the cost of the roof. All three types of roofs have health benefits as well. By far the greatest health benefits come from the reduction in particulate matter that would result if the power generated by solar-paneled roofs had been generated by conventional methods. When all of these costs and benefits are added up, the model predicts that a cool roof costs about $0.73 per square foot to install and maintain, while its total benefits (net present value calculated over a 20-year period) are $5.45 per square foot. The corresponding values are $22.52 and $60.78 per square foot for a green roof and $0.00 and $77.45 per square foot for a roof on which photovoltaic (PV) arrays are installed. All of the costs are additional costs compared with the cost of a conventional roof.

Noting that the cost premium for a cool roof is less than $1 per square foot and that the health benefits of such a roof are nearly $3 per square foot, Kats noted that this sort of simple and inexpensive change to a roof more than pays for itself. "Just looking at the health benefits from a city perspective leads you to say this should be our standard design policy," he said.

These are just preliminary results,[4] Kats cautioned, but their implication is that cities have the opportunity to save a lot of money, improve the quality of life, reduce health care costs, and reduce energy costs by, for example, changing how buildings face the sun and modifying the albedo—or reflectivity—of the buildings to change how much sunlight the buildings absorb.

[4] An updated analysis of Washington, DC, cool roofs, green roofs, and solar roofs is available in a recent report by Kats and Glassbrook (2015).

Other Building Technologies to Reduce the Impact to the Environment

Kats then spoke about two emerging technologies that can help cities reduce their costs to the environment. The first is a way to reduce "embedded carbon dioxide," which refers to the carbon dioxide from material, such as cement, used in the construction of a building, road, or other structure. Embedded carbon dioxide accounts for 6 percent of the world's production of carbon dioxide and also a large percentage of the District of Columbia's carbon footprint, he said. Indeed, it can take up to 10 years of operating a building—with all of the energy consumption that that entails—to produce the same amount of carbon dioxide that was created in the building's construction. Kats said that a company, Blue Planet, on whose board of directors he serves, has developed a technology that captures 80 percent of the carbon dioxide coming out of flue stacks and turns it into cement products, such as aggregates used for highway construction. In this way, the amount of embedded carbon dioxide can actually be negative; that is, the amount of carbon dioxide stored permanently in the materials—and kept out of the atmosphere—is more than the amount generated in their production. The materials are also very reflective, so they do not absorb as much heat from the sun as typical building materials, lessening the heat island effect in cities. The materials were scheduled to undergo at-scale testing in December 2014, Kats said, and his group will soon be getting test results back from that testing.

The second project that he described is a partnership between BrightFarms and the District of Columbia Department of General Services to grow food in a 120,000-square-foot greenhouse in Anacostia in the southeastern section of DC, with the first harvest expected in 2016. "This will employ 25 to 30 people, full-time equivalent, and produce more than 1 million pounds of green produce per year," Kats said. "It will be harvested in the morning, sold in the afternoon, and eaten in the evening rather than shipped across the country." It is expected to decrease the carbon dioxide emissions associated with food production and distribution by 97 percent, helping the environment and also increasing the availability of fresh food in places that do not normally get it.

Kats also mentioned a technology called NEST, which is a learning system for controlling residential heating and air-conditioning in a smart way. By shifting when a home's air-conditioner is operating, for instance, it can significantly reduce residential power consumption, thus decreasing power bills. It can also move much of the power usage to off-peak hours,

lessening the overall load on the electric utility. It also helps enable renewable energy. Because solar power is generated only when the sun is shining, it will be helpful to be able to reshape power usage so that more is used during daylight hours and less is used at night, and NEST can do this. It is a very interesting kind of emerging area for energy and comfort control, Kats said.

The final technology that Kats described was an initiative called Places, in which his company, Capital E, is a minority partner. The idea behind Places is to use data on locations and their characteristics to help determine the risk involved with a mortgage loan. Kats described the idea behind it as follows.

A person might not keep up payments on a mortgage for a variety of reasons. One is because the value of the home has dropped below how much was owed on the mortgage. "It turns out," Kats said, "if I live in a walkable, mixed-use TOD [transit-oriented development]-type neighborhood, the value of my home declines much, much less in an economic downturn." A person who has a home in a walkable, mixed-use neighborhood with good transportation and a FICO[5] score of 600 turns out, according to the group's analysis, to be less likely to default on a mortgage than someone who has a FICO score of 700 and a higher income and who lives in a neighborhood with sprawl.

Another reason a person may default on a mortgage is if he or she loses his or her job and is not able to get another job nearby. "That is much less of a problem in a walkable neighborhood with access to public transit," Kats noted. Furthermore, because the cost of buying, maintaining, and using a car is about $8,000 per year, a person living in a walkable neighborhood is more likely to be able to make do with one less car, making it more likely that the person could apply that money to keeping up payments on a mortgage.

When the location-specific data are combined with the additional neighborhood characteristics related to transportation and employment, the Places model turns out to be a far better predictor of whether a person will default than a conventional FICO score, Kats said. To test the Places program, it was used to analyze a 100,000-loan portfolio evaluated and invested in by AIG. "They went back and applied the metrics that we developed, and it turns out they would have saved $250 million to $300 million by not giving loans to certain people who had relatively high FICO

[5] A FICO score is a type of credit score that makes up a substantial portion of the credit report that lenders use to assess an applicant's credit risk and whether to extend a loan.

scores but were in a sprawl and therefore had systematic risk along the risk attributes we talked about." More importantly, Kats said, "they would have done another $5 billion to $6 billion in loans to individuals who did not have high enough FICO scores but whose homes were in neighborhoods that were associated with walkability, flexibility in terms of jobs, and flexibility in terms of transportation."

Thus, Kats said, the program represents a powerful new method that cities can use to think systematically about exposure to risk in a way that drives recognition of value toward walkability and away from sprawl.

A PLAN FOR SUSTAINABILITY

The second speaker was Brendan Shane, chief of the Office of Policy and Sustainability at the District of Columbia Department of the Environment. He is a principal staffer for the mayor's Sustainable DC initiative who works with various segments of the District government and community stakeholders to define and implement the mayor's vision of making the District of Columbia the greenest city in the nation.

Today, Shane began, sustainability is defined by the three Es: environment, economy, and equity. Here "equity" refers broadly to the community fabric, the public health, and the overall equitable nature of the community.

Sustainable DC

The Sustainable DC plan[6] took about 18 months to develop, Shane said, although it was originally intended to be finished in 6 months. "We ended up with a very ambitious set of goals [and] a big document, which is available online." The main goal of the plan is that within a generation the District of Columbia should become the healthiest, greenest, and most livable city in the country.

The past decade has seen a burst of activity in the area of green building, Shane said, specifically in healthy buildings, green roofs, storm water management, cleaner water programs, and green power. Among all the cities in the United States, the District of Columbia ranks near the top in the number of green and energy-efficient buildings, both in absolute numbers and in numbers per capita. "We are only a city of 650,000," he

[6] More information about Sustainable DC is available at www.sustainabledc.org (accessed April 16, 2015).

said, "but in terms of real numbers, we have as many energy star buildings as Los Angeles. . . . We have as many LEED-certified buildings as Chicago and New York and cities which are 5 and 10 times our size."

The District uses 100 percent green power, which has required a significant investment from both the public and private sectors, he said. "The government is not buying all this power and it is not building all these buildings; this is the private sector adopting market greening in a significant way." Another green initiative is the District's 5-cent fee for disposable bags supplied at a grocery or other store, which has led to an 80 percent decrease in bag usage and a corresponding drop in the number of bags that end up in the Potomac River. The District also has more than 2 million square feet of green roofs, and, Shane said, over the past several years the District has been installing more green roofs by square footage than any other city in the United States.

Furthermore, the first major bike-sharing system in the United States was in the District of Columbia, and that program is still one of the most active in the country. Although the bike-sharing programs in New York City and Chicago, Illinois, are larger, the DC program is still growing at a remarkable rate, Shane said.

Moving to how DC defines "sustainability," Shane offered four characteristics. First, it is about creating options: "options about where you live, how you can get to work, what kind of power you buy, what kind of job you can have, all sorts of things." Second, it is about long-term vitality for the city. Third, it is affordability. "If you asked what the number one issue in the mayor's election we just had last week, affordability might be it," he said. And, fourth, it is healthier families.

The Sustainable DC framework has 32 goals, 31 targets, and 143 actions, but they are all organized around four broad areas: (1) jobs and the economy, (2) health and wellness, (3) equity and diversity, and (4) climate and the environment. Similarly, the solutions proposed fall into seven broad areas: the built environment, energy, food, nature, transportation, waste, and water. Some of the metrics and targets are still being defined, Shane said, because it is not always easy to measure progress.

In the area of health, DC is focusing on two core challenges: obesity and asthma. One in three DC children is at risk of becoming overweight or obese, and the risk is much higher among lower-income groups (especially residents in Southeast DC). The risks of asthma are spread more equitably around the city.

At this point, Shane acknowledged, the plans for dealing with these health issues are not particularly detailed or sophisticated, in part because

this is the first time that the city has focused on these issues. The first goal in the area of health and wellness is to "inspire healthy, active lifestyles for all residents, regardless of income, ability, or employment." An associated target is to cut the citywide obesity rate by 50 percent by 2032. "Anyone who works with that field would know that is pretty aggressive," he said. "The goals throughout this plan are very aggressive and they tend to be round numbers—we are going to cut energy use in half; we're going to cut obesity in half." Among the actions identified to be needed to meet this goal are expansion of access to public parks and programming to promote healthy lifestyles through physical exercise and to investment in a public health campaign to promote the benefits of healthy eating and active living.

The second health and wellness goal is to "create safe environments that are conducive to healthy living." The associated target is to "require all new housing projects in the District to meet Healthy by Design standards." To meet this goal, the District will develop a Healthy by Design program for new affordable housing projects that focuses in particular on low-income and underserved neighborhoods. The idea, Shane explained, is that housing needs to be designed with health in mind. "Transit-oriented access, all of the green elements you expect to see in new buildings should be embodied there." A second action will be to assess the various environmental, economic, and social barriers to healthy lifestyles specific to DC.

Climate Goals in the Sustainable DC Plan

On a larger scale, the Sustainable DC plan also has what Shane called "big-picture goals for climate." One is to "advance physical adaptation and human preparedness to increase the District's resilience to future climate change." However, the goal is aimed at more than dealing with events that may occur several decades from now. "We need to do it for the climate we have right now," Shane said. "[Hurricane] Sandy is an example of that." The target associated with this goal is to require that all new buildings and infrastructure undergo a climate impact analysis. "This is a building or road or other public infrastructure that is going to be there for 50 years, maybe longer, so we need to plan for the climate 50 years in advance."

Various impacts of climate change must be planned for, Shane said. The average temperature is increasing, sea levels are expected to rise, and habitats are changing, so various species are on the move. For instance, the Asian tiger mosquito was not found in the DC area some years back; now it is.

Sustainable DC is now working on a climate resiliency and adaptation plan. The first step is a three-part study that is analyzing climate impacts,

assessing risks and vulnerabilities, and identifying and prioritizing solutions. Expected temperatures are particularly important, Shane said. "You can get out of the way of a flood most of the time, . . . but heat is what kills in numbers and kills the most vulnerable people more than others."

Among the potential solutions that have been studied is the expansion of cool roofs. What would happen if the cool roofs were to spread across the system until they were on a substantial percentage of the city's roofs? "When you start increasing the reflectivity of the city," Shane said, "you start seeing decreases in morbidity—in this case, reducing the number of deaths on an average of 6 percent if we increased by 10 percent the urban reflectivity" (Kalkstein et al., 2013).

One of the complications that the study revealed was that if the District increased its number of cool roofs, the majority of the benefit would actually be to Prince Georges County in Maryland, which lies to the east of the District, because that is the predominant direction in which the wind blows. "This isn't something that we can solve alone," Shane said. "We really want Virginia to cool down [Virginia is to the east of the District], to be more reflective, because if they are cooler, then we are cooler."

Other Health-Related Initiatives in the District

Shane described a number of health-related initiatives that the District is currently carrying out. First, he mentioned Capital BikeShare. "I think it's one of our best examples of a rapid change," he said. The program has grown so rapidly that the District is now working on increasing the number of places where people can ride bikes. "We need more bicycle tracks, we need safer bicycle tracks, we need more trails, and things like that." A related program, called Bank on DC, provides discounted access to bikes to residents of Ward 7 and Ward 8 (the city's two poorest wards) who do not have credit cards (which is a requirement of Capital BikeShare).

Play DC is a 10-year, citywide initiative aimed at rebuilding the city's playgrounds and parks. It is about half done now, Shane said. For instance, 40 of the District's 75 playgrounds have been renovated. The new designs were done in partnership with the community, and the goal has been to provide more opportunities for people to play in a safe place.

Live Well DC is an initiative to increase public awareness of the importance of making healthy decisions in terms of both physical exercise and diet. Lead-Safe Washington is focused on reducing risks from lead-based paint hazards. It does not stop with lead-based paint, however. The ultimate goal is to develop a more comprehensive approach because homes

with peeling lead paint often have mold, energy use, or other issues. Park Prescription is a pilot program in which family physicians hand out prescriptions for exercise and time at prescreened locations. "They don't just say go do some exercise," Shane explained. "They say go to this playground, use this track or this pool, giving people a more specific prescription to try to get them to understand their opportunities as well as the importance of health initiatives." The Age-Friendly DC Initiative is doing a survey of every block in the city to find out how friendly it is for older citizens to walk or get access to transit or other things that they need.

DISCUSSION

Goldman started the discussion session by saying that a great deal of concern about gentrification exists in DC.[7] "On the one hand, you want people who work in the city . . . [and] to be living in the city, and . . . no city can thrive if none of the people in the city generate income," she said. "On the other hand, some of the traditional neighborhoods are concerned as development is moving out through the city, even with the proposals to create new amenities." So she asked Kats and Shane to comment on gentrification.

"It's a very challenging issue," Shane said. "Often, when we put out our goals and challenges and we're looking at economic growth and health and wellness and equity, the first question you get is, How are you going to keep the community equitable? How are you going to keep it affordable if we have bike lanes everywhere and every millennial across the country wants to move here? There is no simple answer."

The District is trying various things to keep housing affordable. In particular, the current mayor is looking at major investments—$100 million per year or more—to preserve and increase affordable housing. And even with that kind of money, Shane said, it is challenging, in the face of the market transformation that is now taking place in the District, to keep

[7] According to the Centers for Disease Control and Prevention, "gentrification is often defined as the transformation of neighborhoods from low value to high value. This change has the potential to cause displacement of long-time residents and businesses. Displacement happens when long-time or original neighborhood residents move from a gentrified area because of higher rents, mortgages, and property taxes. Gentrification is a housing, economic, and health issue that affects a community's history and culture" (CDC, 2013). However, gentrification can help return middle-class families to disinvested areas, as well.

housing affordable. Recent news reports indicated that in the past year there had been a 34 percent increase in median home prices in one neighborhood in Southeast DC, from $250,000 to $350,000. "Those are the kinds of market forces you're battling against," he said. "The people are arriving, and the prices are going up."

But the issue of where the real estate market is going should be kept separate from the issue of improving the various communities in the District, Shane said. "The idea that you have a walkable neighborhood, a healthy neighborhood, is independent of whether someone is new, moving into the area, or has been here for a while, whether they paid $50,000 for their house or whether they paid $1 million for it." Thus, he and his colleagues focus on improving the quality of the community citywide, including the affordable housing, and on developing new assets that will improve the lives of everyone in the city. "You need to understand that the community will be changing, will be growing, and you need to build these assets in and make sure they are accessible to people at all levels of income," he said.

Kats added that he thought that DC had done a great job in terms of engaging all parts of the community in discussions about the future of the city. "I think every ward feels like they have been listened to . . . and not just listened to, but their input has been really important."

Concerning gentrification and equity issues, Kats said that the District's efforts to affect the cost of transportation, reduce energy costs, and improve health will have major effects on the city's low-income citizens, who are disproportionately affected by health issues and the cost of energy and transportation. "Low income is very concentrated in areas with few trees, very low albedo [i.e., reflectivity], meaning excess heat, excess smog, and excess respiratory problems," he said. "So the systematic solutions that the city is putting in place to bring down temperature and to make these buildings more affordable . . . are going to have measurable positive benefits. It doesn't offset the rise in value, but I think the city has really been admirable in how well it has addressed this and is addressing it."

Next, Jack Spengler of Harvard University mentioned two innovative programs being carried out by cities elsewhere. Vancouver, British Columbia, Canada, has a program that is mapping indicators of happiness, thriving, and social ability down to the level of census tracts as a way of understanding factors affecting the cohesiveness and health of a community. A second program called One Science in Washington State is looking to use family services to reduce various stresses on children because these stresses

have been shown to predict risky behaviors, health, income, and various other outcomes later in life.

John Balbus of the National Institute of Environmental Health Sciences asked Shane a question about how the effects of the various analyses that he was talking about are measured. For example, in saying that a 10 percent increase in reflectivity would result in a 6 percent decrease in heat deaths, how is that measured? Is that done completely according to a model, or are there programs looking at actual health effects? Specifically, Balbus spoke about the difficulty of tying effects to causes in an environment where the effects may be mediated by very small scale phenomena and the variables are constantly changing. "If you have a neighborhood and you increase the value of the homes 200 percent and you change the people in the neighborhood, you will change the health in that neighborhood," he said. He then asked, "how do you evaluate the program in light of the population changes that may be occurring as well? Are you tracking the original residents?"

Shane answered that he could only speak in generalities and that others were more familiar with the specific details. But, in general, he said, many of these programs are only getting started now. "Ideally, we would be doing the baseline assessments and have that information now. Then, as we move to cooler roofs in residential neighborhoods, as we plant a tree and then wait a decade for it to actually be big enough to do anything, as we make changes that are long term, some of these need to be looked at long term." However, he added, he does not know for sure that anyone is actually planning to look systematically at the effects in a way that will deal with the various complications.

Kats expanded on the answer to Balbus's question. "John Davies Cole, who is the state epidemiologist for DC, has been helping us as well," he said. "We've gotten health data by ward, including hospital visits. Somebody who suffers from asthma or allergies goes to the hospital. They can't pay for it, but somebody pays for it and it ends up being a real cost. Mapping those costs has taken quite a long time, and I think we are at least taking a step in that direction. Those are quantifiable, and they do vary by income, they vary by location, so you can begin to map things which are triggered by or contributed to by excess temperature due to the urban heat island. . . . I think we're starting to use that data in a way that's constructive in terms of shaping policy and quantifying in a fairly rigorous way what this means."

Bernie Goldstein of the University of Pittsburgh had two questions. First, what is being done about education? In Pittsburgh, Pennsylvania, once

young professionals start having children, they tend to move out of central Pittsburgh because the inner-city schools are not good enough, and he said he suspected that the same thing is true in Washington. "How are you going to keep people in these areas that you are building up unless you improve the schools? Why isn't that part of your system?"

Second, Goldstein noted that the city population with the greatest public health problems is the collection of homeless people, yet he had heard nothing about plans to improve their situation. What, if anything, is planned for the homeless?

Shane answered that these two areas are indeed being addressed by the District. For instance, great progress in being made in improving the schools. "The city is seeing a turnaround," he said, "so the public school enrollments are increasing year by year and they are increasing faster each year." This indicates that young people are moving into the District and staying as their children become school age, he said, although he acknowledged that inequities remain and that not all District schools are doing so well.

Part of the success is due to the District's public charter school program, which is one of the most robust in the country, he said. "About 40 percent of public school students in the District are now in a public charter school, which are all over the city with a whole variety of focus areas." The city has also instituted universal prekindergarten that is available for all 4-year-olds and will likely be made available to 3-year-olds as well.

"I think we are starting to see the statistics which show that families are staying, the numbers of enrollments are rising," he reiterated. "The problem is that the families that are staying and the schools that are bursting at the seams tend to be in pretty affluent areas. Diversity is decreasing in some of these schools, as they are made up more and more of people living in that neighborhood, as opposed to kids moving around the city to these schools." In other words, problems remain, but the city has been working hard to improve its schools and make the District a place that young people with families want to live.

There is less success to report with homelessness, Shane said, but the city is working on it. "It's a very high visibility issue right now as the city is trying to figure out how to move people into permanent housing, to move people into transitional housing, and, frankly, getting away from debacles of recent years where the city has just been overrun by the numbers," he said. "As the affluence increases, the housing prices are going up. In recent years, especially last year's cold winter, it all converged when you had more and more people not being able to afford housing and colder and colder winters,

which led to the city having to mobilize in a way it never had before around hypothermia and homelessness." Currently, a range of homelessness programs is in place, and the District administration is trying to figure out which approaches to addressing homelessness will be the most effective.

Linda Birnbaum, director of the National Institute of Environmental Health Sciences, spoke next. She commented that health is not simply a personal issue but that it is affected by factors over which individuals have little or no control. For example, she mentioned that in March 2015 the Roundtable will be sponsoring a workshop on how environmental exposures, such as chemicals and air pollution, can increase the risk of obesity. Given that, she asked whether abandoned areas inside the city are being tested for the presence of cadmium and other heavy metals before they are transformed into places where food is grown. She also asked if anyone has done life-cycle analyses of materials, including solar panels, that are used in the construction of green buildings.

Kats answered that he was familiar with one urban agriculture site in the District that is scheduled to produce 1 million pounds of food per year. "That is actually hydroponic," he said, "and it is extremely tightly measured, so the quality of produce is very high. It's very fresh; there are no contaminants."

Concerning the life cycle of green buildings, he said that the LEED certification program has done a good job with paying attention to the upstream and downstream environmental effects (that is, the effects related to the production and disposal of the building materials). "We invested a lot in large-scale photovoltaics," he said. "There are some nasty metals in some of the PV options, like cadmium and telluride. Those are much more carefully monitored. The whole move has been toward upstream and downstream life-cycle assessment."

As another example, he mentioned PVC, or polyvinyl chloride, which is a widely used building material. "It's great as long as you don't have to manufacture it," he said. "It's great as long as you never have a fire. It's great as long as you never have to dispose of it. But if you think about the front end [production] of PVC and the back end [disposal], there are some real health questions," and so the LEED standards are weighted against the use of PVC because of these life-cycle considerations.

Because the District has adopted not just LEED standards but LEED Gold and LEED Platinum standards,[8] which are even more stringent, it is doing a better job of addressing upstream and downstream issues than most cities, he said.

Shane added to that answer by noting that although the District is not treated as a state in terms of having representation in Congress, it is a state in terms of EPA regulations and so it has a very robust environmental program. "We have 300 people in our agency, and that includes toxics and clean air and clean water programs," he said. "We regulate use of soils and clean-up very rigorously here and have very high standards." Thus, anyone looking to develop a site—even those who are not planning on growing anything in the soil—must have the soil tested and, if necessary, clean it up. Furthermore, the University of the District of Columbia has a laboratory that offers free soil testing for people who may be doing agriculture at their homes or in community gardens. Finally, he added that the large-scale growing programs in the District are generally not soil based. "We don't have that much space," he said. "There are a lot of aquaponics programs developing, fish and plants together, as well as hydroponics."

Faiyaz Bhojani, from Royal Dutch Shell, asked two questions. The first concerned how best to quantify the benefits of various programs aimed at improving people's health, productivity, and environment. Shell has various such programs and has resorted to speaking about "value on investment" rather than "return on investment" because of the difficulty of quantifying such returns. Second, he asked in general terms about developing partnerships between the private and public sectors. "Employers cannot do this all by themselves, nor can the NGOs [nongovernmental organizations], governments, et cetera," he said. "We have to develop partnerships in figuring out how we can help each other because the ultimate goal is still the same thing: thriving people, better environment."

Shane answered that partnerships are crucial. In terms of controlling carbon dioxide emissions, for example, the government is a relatively small player. About 6 percent of the District's emissions are from the government, while 94 percent of the emissions are under private control. "You could use similar numbers probably for making people healthier or getting them to exercise," he said. "The ability to achieve any of our big-picture goals

[8] To receive LEED certification, building projects satisfy prerequisites and earn points to achieve different levels of certification. These levels are Certified, Silver, Gold, and Platinum. There are different standards for residential buildings and commercial buildings, for example.

comes down to working with private sector, motivating private-sector business and institutions and individuals to move."

Sometimes, of course, the government uses "the regulatory hammers," Shane said. It sets standards that the private sector must follow. For instance, in summer 2014 the District banned the use of polystyrene for take-out food containers. "The idea is that it is replaced by alternative products that are combustible and more easily recyclable," he said. "We want to reduce the risk and create an opportunity there. We will use some of the tools where we can force an action and make a change."

On the other hand, the District is also interested in working with the private sector in various areas on a voluntary basis. For instance, the District has a voluntary program called the Smarter DC Challenge that challenges businesses to be smarter about the way in which they operate. "We provide incentives where we can," Shane said, "but it's about networking, about leadership from the private sector in the workplace."

As for quantifying benefits, Shane said that when a clear business case for green power exists—with data showing that green power is in businesses' best interests—real movement will take place in the market on a larger scale. "So we need to be working to make those connections and have it be something that pencils out as a business case," he said. "We don't do it enough yet, and we are working and hoping, through some partnerships with local universities, to start ramping up that kind of research effort, at least for the DC market."

On the quantification issue, Goldman said that when George Washington University built a LEED Platinum building, people from the university administration often questioned the cost and whether it was worth it—even down to the issue of installing the more expensive but more energy-efficient LED lights. "We were fortunate enough to have a sustainability office in the university that could come up with the cost savings for the electricity and help us do the comparison so we could justify the lights," she said. "That happened over and over again." Unfortunately, she said, many businesses are not so lucky and do not have someone who can quantify the benefits of such decisions.

Shane added that at the moment a number of researchers are working to quantify the benefits of energy- and health-related choices, "but the case isn't always there and the research isn't as robust as it needs to be."

Richard Jackson from the University of California, Los Angeles, commented that it is important to document the benefits of the various programs being put into place. "There is supposed to be 1 percent set aside for art in many places, there is supposed to be 1 percent set aside for

evaluation in public health programs, and I would assert there needs to be the funding to really document these impacts that you are having," he said. "This can't be done by a busy epidemiologist or public health researcher who has already got 50 other things to do and doing it out of good will; it has to be supported." He also asked Shane what "flipped the switch" in the District. "Why did this place go from completely dysfunctional to really a paradigm and a model?"

Shane responded that there were a number of different switches. Part of it was that the DC mayor made sustainability a major focus "and invested in it and provided the bully pulpit that helped so much of the rest of us in the government, staff folks, move things forward." Another part of it was that the U.S. Green Building Council is headquartered in the District, and thus, the council could influence thinking in the District. Finally, he said, the development of the D.C. Green Building Act in 2005 and 2006 was the result of a coming together of the private sector—particularly the District's builders—and government to say, "Yes, this is the future. We're going to move this way." Once the standards were passed, even though they would not go into effect for the private sector for a few years, people recognized that this was the direction the market would be going, and the result was a huge upswing in the adoption of green building practices in the city.

Jackson also made reference to the graphs that Kats showed indicating that mortgage lenders face fewer risks lending to people in more livable, walkable parts of a city and noted that this could have serious implications for the nation's suburbs in the future.

"It's just a mind-boggling question," Shane said. "We are in now a wealthy, dynamic city, . . . and I think we have an opportunity to lead. We need to be leading because we have the resources to lead, and we are transit oriented and we have a lot of the benefits. But if you start looking at how to move these concepts to suburban America and to 90 percent of the rest of the world, it is extremely difficult. You run into the fact that we are still very much building the old way. If you just go 15 miles from here, you will find the exact same type of housing that was being built 10 and 20 years ago. Maybe it's a little denser, maybe there are a few more townhouses instead of single-family homes, but there's a big disconnect." Groups like the Urban Land Institute are looking at how to retrofit housing—how to take a system that was built around the car and suburbanization and make it into something different—but no clear answers exist yet.

Kats offered a different perspective. "People point to Manhattan as a fantastic model of walkability," he said, "but there are parts of the five boroughs that are just completely unwalkable." What is important is

whether walkable areas are emerging through integrated mixed-use dense and walkable design. When such areas do emerge, he added, it is typically the result of an intentional construction effort involving a combination of public and private incentives and investment.

One key is flexibility in zoning to allow retail below and residential above in multistory buildings, or even vice versa. The fastest growth in the past 5 years, Kats said, has been in suburbs and areas that have intentionally developed walkable spaces, and those places often serve low-income people extremely well.

Al McGartland from EPA noted that, according to the National Air Toxic Assessment Program, the Washington, DC, area has various automobile-related air pollutants because of the large numbers of people who drive in the area, even with the presence of an excellent public transit system. He asked if any policies to get people to drive less are being considered.

Shane said that there are. For instance, the recently passed Sustainability Act required that transit benefits be given to a much larger swath of private-sector employers than had previously been the case. Within the federal government, there are efforts to reduce the amount of free parking that agencies provide to their employees. The District of Columbia Department of Transportation has a sustainability office that has been involved in developing a long-term master transportation plan for the District that is called Move DC. A number of other transportation-related initiatives also exist, such as performance parking, expanded bus routes, and various efforts to increase the attractiveness of cycling.

In 2013, Shane said, the District passed Los Angeles as the U.S. metropolitan area where people spend the most time in their cars, so the issue has assumed even greater urgency. "There are a lot of reasons [why] and ways you can improve people's lives by getting them out of their cars," he said. "The city is working on a number of those."

Paul Sandifer from the National Oceanic and Atmospheric Administration asked about the program that encourages physicians to write prescriptions for physical activity. In particular, he noted that exposure to biologically diverse environments has been shown to be beneficial for children with asthma, and he wondered if there is any screening of the green spaces that prescriptions are written for.

Shane answered that the District of Columbia Department of Health is working with the District of Columbia Primary Care Association to determine the most effective approaches to such prescriptions. Furthermore, he added that the population of District is fortunate to have access to more

biologically diverse environments than the populations of many other urban areas because it is a federal district with a number of areas that are part of the National Park System. "We also have a number of city parks that are wild spaces that allow people to go into nature, even though you are in the middle of the city," he said. "The mayor talks a lot about taking the paddle ride down from the Maryland line on the Anacostia River coming down through the city. You just would not know you are in Washington, DC. So some really fabulous opportunities exist, and connecting people to those is one of our efforts."

Ann Carroll with the Office of Brownfields and Land Revitalization of EPA asked about the possibility of paying for health programs through the use of tax increment financing (TIF), which is a way of devoting future gains in taxes—for instance, gains caused by increasing property valuations—to pay for current programs, generally with the expectation that the current programs will lead to increases in the tax base and thus eventually pay for themselves. Health departments in many areas have been getting less and less funding in recent years, she said, and it will be important to once again build up these departments.

Shane replied that the District has used TIFs quite a lot for the general economic revitalization of neighborhoods, although not for financing health programs. "The landowners agree that as improvements are made, some of the increased tax value will be dedicated back to the city or the value will be captured," he explained. There have also been a number of examples of green TIFs around the country. To his knowledge, he indicated, no health TIFs have been put into effect, but, he added, "I would think that some of those green TIFs may well have a number of health-focused outcomes very well integrated in them. It would be interesting to see where those are."

Kats spoke briefly about a green affordable housing example led by Enterprise Community Partners and called the Green Communities initiative. The goal of the initiative is to provide green affordable housing and end housing insecurity. He noted that after 15 years, "the occupants can then own that property, and if that property is green, it has a much higher value than nongreen both because the neighborhood is more attractive, better maintained, is more flexible, is better designed. For many low-income families, it's the single largest opportunity they have to get significant equity," he said.

Generally, he noted, when developers are required to include low-income housing in their developments, there is a stigma associated with that housing. However, when it is green affordable housing, the stigma is much less, to the point that the affordable housing is more likely to be integrated

with the rest of the housing development rather than kept to itself. "In other words," he said, "the aesthetics and the [design] quality associated with green design offset the stigma of affordable and make affordable a more attractive—or less undesirable—build-out requirement for conventional developers."

REFERENCES

CDC (Centers for Disease Control and Prevention). 2013. Healthy places: Health effects of gentrification. Atlanta, GA: CDC. Available at http://www.cdc.gov/healthyplaces/healthtopics/gentrification.htm (accessed April 16, 2015).

Environmental and Energy Study Institute. 2012. Fact sheet: Cool roofs. Washington, DC: Environmental and Energy Study Institute. Available at http://www.eesi.org/files/cool_roofs_072412.pdf (accessed April 15, 2015).

Kalkstein, I., D. Sailor, K. Shickman, S. Sheridan, J. Vanos. 2013. Assessing the health impacts of urban heat island reduction strategies in the District of Columbia. Available at http://www.coolrooftoolkit.org/wp-content/uploads/2013/10/DC-Heat-Mortality-Study-for-DDOE-FINAL.pdf (accessed September 16, 2015).

Kats, G. 2006. Greening America's schools: Costs and benefits. A Capital E report. Washington, DC: U.S. Green Building Council. Available at http://www.usgbc.org/Docs/Archive/General/Docs2908.pdf (accessed March 19, 2015).

Kats, G., and K. Glassbrook. 2015. Washington, DC smart roof cost–benefit report. Washington, DC. Available at http://cap-e.com/wp-content/uploads/2015/04/DC_SmartRoofReport_2015-04-16.pdf (accessed December 1, 2015).

Kats, G., J. Braman, and M. James. 2010. *Greening our built world: Costs, benefits, and strategies.* Washington, DC: Island Press.

Takaro, T. K., J. Krieger, L. Song, D. Shaify, and N. Beaudet. 2011. The breathe-easy home: The impact of asthma-friendly home construction on clinical outcomes and trigger exposure. *American Journal of Public Health* 101:55–62.

USGBC (U.S. Green Building Council). 2015. Green building facts. Washington, DC: USGBC. Available at http://www.usgbc.org/articles/green-building-facts (accessed June 22, 2015).

World Green Building Council. 2013. The business case for green building: A review of the costs and benefits for developers, investors and occupants. World Green Building Council. Available at http://www.worldgbc.org/files/1513/6608/0674/Business_Case_For_Green_Building_Report_WEB_2013-04-11.pdf (accessed April 9, 2015).

3

Rebuilding Efforts in Detroit, Michigan

The workshop's second session focused on case studies from Detroit, Michigan. The troubles facing the city of Detroit are well-known. For example, Detroit has lost more than half of its population since its peak in the 1950s, leaving a huge percentage of the city's residential and commercial buildings abandoned. Session moderator Richard Jackson, professor and chair of the Department of Environmental Health Sciences at the Fielding School of Public Health at the University of California, Los Angeles, spoke of a visit to Detroit in which he was stunned to see block after block with few or no buildings and a vast collection of abandoned industrial infrastructure. Detroit's once-gorgeous train station, 20 stories high, was deserted and beginning to fall apart, he said. In July 2013 the city filed for bankruptcy, which was the largest municipal bankruptcy ever filed in the United States.

Still, as the session's speakers attested, the city is once again moving forward. On November 7, 2014, just 3 days before the workshop, the city's bankruptcy plan was approved, and this approval is the first step in its process of exiting bankruptcy. The next few years will be crucial in the revitalization of this once-vibrant city. As the three presenters discussed, many of the organizations involved in the revitalization process recognize the importance of using this opportunity to address issues of public health, and various strategies have been devised for that purpose. In some ways, as individual speakers noted, because so many things in Detroit need to be fixed, the city will have more flexibility to attack such issues as infant mortality, obesity, and health equity. Although Detroit is not exactly a blank canvas, it is certainly a much emptier canvas than Washington, DC, or the New York City area, and the revitalization plans for the city reflect this.

DETROIT FUTURE CITY

The session's first speaker was Dan Kinkead, the director of projects at the Detroit Future City Implementation Office.[1] He spoke about what Detroit Future City has been doing to transform Detroit into a healthier, more vibrant city, including both the organization's planning efforts and what it has done to this point to implement those plans.

The Detroit Future City initiative has been funded completely by philanthropic organizations, including the Erb Family Foundation, the Ford Foundation, the Knight Foundation, The Kresge Foundation, and the W.K. Kellogg Foundation, Kinkead said. It was begun in 2010, and its first 3.5 years were devoted to an extensive planning process, which led to the release in 2013 of a strategic framework, which Kinkead described as "a 350-page guide for Detroit's transformation." Shortly after the release of the framework, Kinkead was asked to help start up the Implementation Office.

This was very different from the normal sort of municipal planning exercises, which are generally done within a city government and moved forward by the city administration, Kinkead noted. "I think many would argue that we had a public sector that wasn't entirely prepared to move this forward," he said. "We wanted to make it happen, and I know many of the foundations that supported the work wanted to make it happen. So, since then, we have . . . moved a number of initiatives forward, built a staff, built a budget," and put together an agenda of what we were going to accomplish.

With Detroit emerging from bankruptcy shortly before the workshop, it is a critical moment in the city's history, Kinkead said. Although the city is typically defined by its overwhelming liabilities and overwhelming challenges, the people involved in the initiative believe that those liabilities can be converted into huge assets and allow Detroit to become a global leader for other cities to follow.

Showing an image of Detroit's skyline, Kinkead said that although this is not the part of Detroit typically shown in the media, some remarkable growth is actually going on in the city center, with hundreds of millions of dollars being reinvested in the city, large-scale buildings being brought back on line, and many new jobs emerging every month. Also, plans are in place for 3,500 new multifamily dwellings to open over the next 18 months. "But at the same time," he said, "it is one part of Detroit. In some ways it may be a privileged part that speaks to only a certain type of audience."

Kinkead then showed a photograph of a neighborhood with empty lots and deserted houses. "This, of course, is the other Detroit," he said. "This is

[1] More information about Detroit Future City is available at http://detroitfuturecity.com (accessed April 16, 2015).

the Detroit that we know well. . . . Basically, Detroit is defined in many ways by its overarching vacant areas that have negatively impacted quality of life. They begin to reduce opportunities for residents, and they begin to define an existence that is incredibly challenging for many, generation upon generation, with sites of massive disinvestment and depopulation over time." Still, Kinkead said, it is possible to see this as another opportunity to move the city forward "in a highly equitable way that provides opportunity for all Detroiters." That, he said, is what he would address in his presentation.

About 20 square miles[2] of Detroit are mostly deserted—empty lots and empty houses—Kinkead said. "If you begin to consider the blight that exists on the streets today—blighted structures and the rights-of-way and streets that are adjacent to those—you're closing in on probably 40 square miles, [and] some would argue 50 square miles." For the sake of comparison, he noted that the total area of the District of Columbia is about 65 square miles, so Detroit's situation is equivalent to having three-quarters of the District being vacant. The District of Columbia has a population of approximately 650,000 people, which is just a little less than that of Detroit, whereas the total area of the District is roughly half that of Detroit. "So, in half the size of Detroit, you have all of Detroit's population," he said.

"Here are some other key points to keep in mind," he continued. "In Detroit, you have a city that in many cases, for most of the population, does not satisfy the health needs of its population. You have $1.5 billion worth of spending leakage going out of the city every single year; $200 million of that is for groceries alone. You have a city with three times the rate of childhood asthma compared to the national average. You have 50 percent greater the number of deaths to heart disease every year than the national average." A variety of other challenges exist as well, he said, including high obesity rates. And even with all its vacant land, Detroit has less park space per resident than most of the largest U.S. cities. Those are some of the key problems facing Detroit.

Kinkead then spoke about the 50-year vision that Detroit Future City has developed to address those problems and create a better long-term future for the city. The long-term vision is composed of several major pieces that are fairly straightforward on their own but that combine in a way that should make a major difference, he said. The plan envisions a city with multiple employment districts and a transportation system that connects people with opportunities, it envisions a green city where the landscape contributes to health, and it envisions a city of distinct, attractive neighborhoods.

[2] Detroit comprises approximately 139 square miles.

"As we developed the work, there was a massive effort around civic engagement and building civic capacity," Kinkead said. "This is not a top-down process. This was an effort that was fostered through 163,000 interactions with residents. This is a plan that has been authored by the residents of Detroit, including myself as one of them. Because of that, I think it not only has given all of us as residents a greater sense of authorship in the work, but it has allowed us to be much more informed and present in the implementation of it, and that is critical when you're trying to move something like this forward in a city with the challenges that Detroit faces."

A key principle underlying the development of the plan was that it should be evidence based, Kinkead said. "We have had many impassioned vision plans over the last two decades, . . . but none of them really landed on the ground firmly in a basis of understanding what markets were saying, what demographics were telling us, what educational trends were telling us, what mobility patterns were telling us. That is what this work began to do: a lot of deep-dive diagnostics tied to a wealth of information and community input."

Looking at the situation that Detroit faced, one fact stood out: the current land use of the city is dominated by the single-family home. "This one-dimensional land use is crippling the city," Kinkead said. "In many ways, the city, at nearly 2 million people at its peak population in 1995, was already not sustainable. Today we're just a much more exacerbated version of that."

Thus, the long-term vision calls for a more balanced city, one that actually recognizes all of the vacancies that exist in the single-family neighborhoods and reenvisions what the city should look like. "We are reconsidering the position of the single-family home in Detroit," Kinkead said. "We're understanding that there are opportunities for green residential living here in areas where we have moderate degrees of vacancy. . . . On top of that, we can begin to create more concentrated nodes of development that can support walkable urbanism, begin to support healthy lifestyles, and focus on connecting people from dense, sustainable neighborhoods [to] opportunities for employment in a range of employment districts across the city that go well beyond the greater downtown and midtown."

A city typically thinks mainly in terms of residential areas and business areas and has zoning that reflects that. Detroit Future City, however, envisions a wide variety of land uses and has developed a set of land use typologies to capture that vision. In the past, for example, employment districts were usually thought of in terms of the places where doctors, lawyers, or businesspeople had their workspaces. "That's fantastic if you happen to be a physician or a leader of a creative enterprise or a lawyer or financier," Kinkead said, "but if you are anyone else, there are a lot of other places that provide employment across the city [that] we have just not recognized: important global logistics hubs in our southwest that were made

by the auto industry over nearly a century, large-scale manufacturing in the northeast, and an educational and medical anchor institution hub in our northwest that rivals that in our midtown area that we just kind of forgot about."

This raises the question, Kinkead said, of how to attract investments in these areas to drive greater opportunity for the city overall. It is not feasible to design a 10-year capital expenditure program, he said, because in 10 years everything will be different.

"You have to understand how you can begin to make subtle moves along the way," he said, "and that is what this plan begins to speak to: understanding areas where we need to double and triple down investment in fixed infrastructure to support the economic growth [that] we need to provide more Detroiters employment opportunities. . . . No matter what else we are doing, if we can't get more folks employed and we can't support them with the infrastructure systems, we are not going to be able to turn it around."

At the same time, Kinkead said, it will also be necessary to rethink how the various city services are provided. "This is not about removing systems," he said. "This is about delivering them in very different ways. This is about taking what was a fixed, large-scale unibody bus that drove down a street five times a day for a woman who might need a doctor twice a month, to an on-call paratransit system that provides for a much higher degree of service at an incredibly lower cost to the public transit provider. Those are the kinds of things of things we're talking about." As another example, Kinkead spoke of ideas to address the city's rainwater capture system. That system is combined with the sewer overflow system, which means that each time that it rains, the water that flows into the catch basins combines with sanitary waste. Whenever the city gets more than half an inch of rain, it overwhelms the overflow system, and the extra water is discharged directly into the Detroit River, which in turn flows into Lake Erie. "This summer Lake Erie had a huge phosphorous bloom, not unrelated to these kinds of issues," Kinkead said, "so this is a critical issue."

In 2011, Detroit had 36 such direct discharges into the river, which is 31 more than the limit of 5 set by EPA. "We think we can get that down to around five discharges if we use our available land area," he said. "The land that sits there fallow, contributing to blight, can actually help us create a new dynamic system, one that we have just not considered in the past."

More generally, the long-term plan envisions a number of uses for the extra land that sits unused in Detroit today. "Detroit might be the first food-secure city globally by 2050 with the ability to produce energy, biomass, switchgrass, anaerobic digestion, and photovoltaic power production," Kinkead said. "There was a comment earlier about DC and all the photovoltaic arrays that could go across your roofs. Imagine the costs that

go with planting those on roofs. What if you could do that in a holding strategy across open, available land and run green infrastructure systems through them to capture storm water? Then you've got something, and you could actually begin to provide major power back to the grid. We're beginning to look at these things now."

Of course, these plans must be implemented, and Kinkead next discussed the implementation process that is being put in place. First, he noted, there will be careful communication and coordination throughout the implementation. Everything that has been done so far has been done through partnerships, and that will continue. "We make sure that we're strategically coordinating and informing decisions along the way in a way that we have just not done in the past."

There are five implementation priorities, Kinkead said. The first is to create an open-space network to reutilize vacant land. This is being done in several ways. One is a carbon-buffering pilot program. The idea is, in essence, to plant trees and other plants along major highways to block much of the particular matter emitted by vehicles traveling along those roads and thus to improve air quality. Detroit also has a Dendro-Remediation pilot program that is intended to remediate toxins in the soil around Detroit. "Detroit has a lot of available land that is toxic," Kinkead explained. "But we don't have the need for reinvestment and reutilization of the land in conventional ways for a long time; therefore, we can use slower, more cost-effective, and more natural methods for that remediation."

To help guide decisions about what to do with vacant land, Detroit Future City is developing a vacant land transformation guide with the goal of stabilizing neighborhoods.[3] It provides a menu of options for residents to choose from to determine how to reutilize and improve the available land.

The second implementation priority is to renew systems strategically and innovatively. One such program is the one described earlier to minimize direct discharges into the Detroit River. Another is aimed at restoring much of Detroit's tree canopy. "By some estimates, Detroit has half the tree canopy it should have," Kinkead said. "If we can bring back the other half through concepts like this [i.e., restoration of the tree canopy] and the open-space network, we can begin to save lives. Most of our seniors live in areas that have low canopy coverage." The effect, he said, is the loss of many lives each summer when temperatures rise.

Detroit Future City is also working with the U.S. Department of Energy to deploy solar power systems on some of the unused land. "We think that on 30 to 35 acres of land we can produce 5 megawatts each year and

[3] Since the workshop, the *Vacant Land Transformation Guide* has been released and can be found at http://detroitfuturecity.com/initiatives/vacant-land-transformation-guide (accessed August 4, 2015).

incorporate green infrastructure systems that can also go to pool water for irrigation for adjacent biomass and food crops," Kinkead said.

The organization is also working with the White House Office of Science and Technology Policy to develop various technologies to help Detroiters in various ways, from figuring out the best way to catch a bus to learning what employment options are open to them. Because it has not had the money to invest in technology, Detroit fell behind other cities, but this could be turned to its advantage, Kinkead suggested. "Where many cities dutifully paid billions and billions of dollars for their Cray mainframes in the 1980s, we did none of it, and we have the ability to actually leverage cloud-based services and things like this to jump ahead. . . . We're trying to get there quickly."

The third implementation priority is to improve quality of life. As an example, Kinkead spoke of a community in the north-central part of the city along Seven Mile Road between John R and Woodward. Populated mainly by immigrants, such as Chaldeans (Christian Arabs) and Syrian refugees, the area has suffered mightily over the past few years and has seen many businesses and residents flee. However, historically, the area had a very strong commercial corridor, and efforts are now being made to bring that back and create a strong residential-commercial quarter outside of the downtown area.

Another example of improving quality of life is the way in which the city is approaching deconstruction. "We are bringing down blight in the city," Kinkead said, "but doing it in a way that is much more thoughtful than straight demolition, which contributes to landfills and really underutilizes the opportunity for employment." In particular, Detroit Future City carried out a study of 10 homes in the southwest part of Detroit using five different deconstruction techniques to determine what types of materials could be pulled out of the homes and sold. Straight demolition may seem less expensive, Kinkead said, "but if you add the revenue stream on the resale in there, then the equation changes and opportunities for employment change."

Studies are also being carried out to determine the best ways to demolish structures without spreading toxic materials, such as lead. Nearly 40,000 structures that need to come down in the next year have been identified, and that number may reach 60,000. It is important that the demolition not contaminate the surrounding areas. "We already have an epidemic of lead poisoning in the city," Kinkead said. "We don't want to mushroom this into something colossal that is going to take the city back another 50 years, so we are working on dust management pilots and new techniques to manage this, which in many cases comes down to using a water hose. This is not high tech, but it's important that these things get worked into contracts with contractors that do this work."

The fourth implementation priority is to employ more Detroiters. One small way that they are doing this, Kinkead said, is by using some of the materials that come out of the deconstruction work and developing retail centers to sell the materials and staffing them with Detroit residents.

Detroit ranks second among major U.S. cities for entrepreneurial activity, Kinkead said. Often, however, the sole proprietors working there find it difficult to scale up their businesses. "They work out of their basements and do things at a small level," he said. "How do we get them to rent space, buy equipment, et cetera?" One approach has been a recruiting effort to draw in the Goldman Sachs 10,000 Small Businesses Program, he said.

The fifth and final implementation priority is to strengthen civic capacity, which Kinkead described as "making sure our community in general is better equipped to move ourselves forward in the future." One approach has been to develop curricula in local high schools that will better prepare students for the future.

Ultimately, Kinkead said, after the development of broad strategies and the implementation of policies, success or failure will come down to the efforts of thousands of individuals. Showing a picture of a large group of people helping plant trees along a freeway, he said, "It takes all of these pieces together to have an impact in a place like Detroit, and that is what we do."

HEALTH IN ALL POLICIES

The next speaker was Loretta Davis, president and chief executive officer of the Institute for Population Health, who discussed the "health in all policies" approach and how it applies to Detroit and, more broadly, all of Michigan.

Davis began her presentation by citing a statement made by the National Association of County and City Health Officials. The association recommended that federal, state, and local governments all adopt a "health in all policies" approach in the policy-making process to ensure that policies made outside of the health care sector have either a positive or a neutral impact on the determinants of health.[4]

"When we first started talking about health in all policies," Davis said, "many people saw that as a way to keep progress from happening. You don't want to build this, or you don't want to build that, and people became afraid of this concept of health in all policies."

[4] Information on the Health in All Policies project can be found at http://www.naccho.org/topics/environmental/HiAP (accessed August 4, 2015).

In reality, though, the health in all policies approach is mainly a recognition of the fact that many policy decisions affect the social determinants of health: noise levels; the walkability of an area; how easy it is to travel to one's job, family, or place of worship; and so on. Thus, it is important, Davis said, to involve individuals and groups in the policy-making process who are knowledgeable about health in a broad sense, that is, not just in the traditional medical sense of determination of blood pressure and cholesterol levels but also from a more socially and environmentally oriented point of view.

Davis commented that putting "health in all policies" into effect on a local level may require more than just buy-in from the local health department. "Many times, there are forces that can impede even local public health departments from saying and doing what is right around interventions that are being proposed," she said. Thus, it is often useful to involve other partners, in addition to the local health department.

One such potential outside partner is Michigan Power to Thrive, a network formed by county health departments across Michigan as well as a number of other groups. The network represents the coming together of two powerful disciplines, Davis said: public health and community organizing. "Many times, we [the two disciplines] have not been at the same table," she said, "and when we are, we have been misunderstood. Michigan Power to Thrive is trying to bring those disciplines together."

Davis showed a slide indicating collaborations between community organizers and public health officials and professionals across Michigan. In Wayne County, which includes Detroit, there is a collaboration between the Detroit-Wayne County Health Authority and a community organizing group called MOSES (Metropolitan Organizing Strategy Enabling Strength, which is affiliated with a national network of faith-based community organizing groups). "Along with MOSES, there are public health professionals—not just public health departments, but a cadre of public health professionals—there are also religious institutions, businesses, there are people who are dedicated to schools, early education, all of us coming together to say if we really want to see a change, if we really want to see Detroit's future become positive and bright, then we need to have health in all policies," she said.

Not all of the communities across Michigan are dealing with the same thing, Davis said, so health in all policies provides a rallying call that appeals to people from around the state. "For some areas in Detroit, it may be about housing stock that is very old with lead contaminants," she said. "In another area it may be infant mortality. . . . In some other area, it may be more about minimum wage."

What, she asked, does that have to do with Detroit Future City, described previously? "One of the recent health impact assessments that we conducted took a look at infant mortality in relationship to pay inequity by

gender," she said and noted that pay inequity for women has an impact on health and infant mortality. "As we start to look at economic growth in the city of Detroit, [we must ask], Are these jobs that are friendly to families? Are these jobs that are promoting and having pay equity? Truly, health in all policies from beginning to end."

Davis then went into greater detail on the health in all policies approach, listing five elements key to the approach. The first element is that any policy being considered should promote health, equity, and sustainability. Second, all policies should support intersectoral collaboration. Third, policies should benefit multiple partners. Fourth, policies should engage stakeholders. Fifth, policies should create structural or procedural change. "We want long-term change," Davis said. "We don't want things that just started and then stopped along the way. And that is done by policy and procedure."

Returning to Michigan Power to Thrive, Davis spoke of the network's values. These are shared values of the public health and community organizing communities: commitment to a just and equitable society, a decent quality of life for all, and respect for human dignity. On the network's calling, Davis said, "Our democratic tradition and our commitment to the principles of equity and justice demand that all have a right and duty to participate actively in the social, political, and economic decisions that affect our quality of life. We are called to work together for fundamental, transformational remedies to social and political forces that undermine democracy and limit the power of people to achieve well-being."

There are various tensions between the public health and community organizing communities, Davis said. She mentioned in particular "agitation as a practice." "That is not something that public health always is most comfortable with," she said. "Being a long-time public health person, when they first said agitation as a practice, I got a little nervous myself. Then I came to understand that if we want things that are transformational, long term, and sustainable, it does take a certain level of boldness."

Davis ended with a quote from Tony Iton, senior vice president for Healthy Communities at The California Endowment: "As public health professionals, we need a new kind of practice where public health practitioners understand that creating health equity requires us to be in deep relationship with people who understand and are willing to create and build power. Powerlessness is making us sick."

THE HENRY FORD HEALTH SYSTEM

The panel's final speaker was Kimberlydawn Wisdom, senior vice president of community health and equity and the chief wellness officer for

the Henry Ford Health System. She described the health system and its approach to improving health in Detroit.

The Henry Ford Health System is a $4.2 billion company with nine business units spread across three counties, Wisdom said. It has a 1,200-physician medical group and about 2,200 private practitioners as well as about 1,500 residents training in 40 specialties. The health system receives about $60 million in funding from foundations and the National Institutes of Health, and it has a health plan with about 600 members. "So we are a very complex, comprehensive, quaternary care organization in one of the most challenging cities in our nation," she said.

Through the leadership of chief executive officer Nancy Schlichting and her predecessor, Gail Warden, Wisdom said, the Henry Ford Health System has been committed to the idea that health is more than just health care delivery services and that ensuring individual health requires taking community health into account. Twelve years ago, as Schlichting was directing the development of the health system's strategic framework, she made sure that in addition to traditional pillars, such as people, service, quality, and research and education, a community pillar was included in what was described as "the Henry Ford experience."

The health system's vision statement calls for "transforming lives and communities through health and wellness one person at a time," and that transformational element is key, Wisdom said. "It is not just improving, but we have to be out-of-the-box thinkers. We have to . . . find ways [in which] we can deliberately and intentionally transform our communities."

Furthermore, Wisdom said, the Henry Ford Health System leadership has remained committed to staying in Detroit even during the city's very challenging times. "We are not going to leave the city. We are committed to the city," she said. "That has never wavered in the 30-plus years that I have been in the institution or part of the organization."

Referring to Davis's description of "health in all policies," Wisdom said that the health system is committed to that approach in its own operations. For instance, the health system is redeveloping a 300-acre site just south of its main hospital in Detroit. The demolition of existing housing there offered an opportunity to mitigate various environmental hazards associated with the housing. Furthermore, attention has been paid to the health of the Detroiters hired for the deconstruction.

Showing an artist's rendition of what the 300-acre site will look like once construction is complete, Wisdom described the process as "place making" and said that such place making is an important part of the health system's vision for the area." The goal is to blend the development seamlessly into the community to create a vibrant, walkable place where people want to be," she said. The initiative will build on Henry Ford Hospital's anchor status and will serve as a catalyst for additional growth

and development. "Henry Ford very much sees itself as a catalyst," Wisdom explained. "We cannot do it alone. We need partners, but we can certainly catalyze the economic development in those areas."

The 300-acre site will contain a cancer rehabilitation hospital, but the key to the development of the site, Wisdom said, will be the creation of mixed-income housing. The health system is making a deliberate effort to ensure that many of the employees, particularly those who are at entry levels, can live close to where they work. "So there is very much a focus on mixed-use housing to improve the physical infrastructure," she said.

Another main focus is the creation of bike lanes both at this site and at other places in the health system. The rates of chronic disease in Detroit are much higher than the national average, Wisdom said, and studies have shown that communities with more walkable and bikeable places have lower rates of many chronic diseases. Furthermore, the National Academies of Sciences, Engineering, and Medicine has recommended the construction of sidewalks, bikeways, and other places for physical activity to occur as a way of fighting childhood obesity (IOM and NRC, 2009). "So," Wisdom said, "the Henry Ford Health System is not just talking the talk, but we are trying to walk the walk—or at least bike the walk—where possible. In partnership with the Michigan Department of Transportation, Henry Ford has helped to install dedicated bike lanes on the streets around our main hospital campus. It has also helped to fund a feasibility study for a Detroit bike-share program."

In a similar vein, she said, a major effort is under way to create an overpass over a major freeway that divides the main hospital from another part of the Henry Ford campus that contains the corporate offices, because people would like to walk between the sites.

The health system is also involved in dendro-remediation by installing sustainable landscaping that will include native plants that do not require extensive watering and that will help remove environmental contaminants.

Switching gears, Wisdom then described some of the community engagement and outreach efforts that the Henry Ford Health System engages in. Many of these efforts are aimed at improving equity in health and health care. For example, between 2009 and 2011, the health system carried out a major health care equity campaign whose goal was to ensure that health and health care equity were understood and practiced by the system's providers and researchers as well as by the community at large. "We very much reach out to populations of different races and ethnicities," she said. "We have community advisory boards that we work very closely with in order to help inform us. So it is more than a clinical or quality proposition; it is very much working with our key stakeholders within our community."

The health system has also engaged in a major effort to collect and analyze data on the race, ethnicity, and primary language of its employees and users. The providers at Henry Ford speak more than 60 languages, Wisdom said, and the community that they serve in Detroit is also very diverse. "We have the second largest Arab-American population outside of the Middle East," Wisdom said. "We have large Bangladeshi and Yemeni populations, a large Latino population, and a large African-American population, so understanding through self-report the community we are serving has been very important."

Wisdom added that the health system has strong community ties through several Henry Ford Hospital initiatives. One such initiative, for instance, is Live Midtown, in which the health system collaborates with midtown Detroit, Wayne State University, and the Detroit Medical Center to offer financial incentives for people who are willing to relocate within the city of Detroit. Employees of Henry Ford, Wayne State University, and the Detroit Medical Center can receive loans of up to $20,000 toward the purchase of a primary residence or up to $2,500 to rent a home or apartment. Furthermore, one quarter of the loan is forgiven after each year that a person remains in Detroit, so in the case of the purchase of a primary residence, the entire $20,000 loan can be forgiven after 4 years.

Another community-related effort is Early College, which enrolls students—many of whom are at-risk students from underserved families—in Grade 9 and keeps them an extra year, through Grade 13, at which point they receive a high school diploma, an associate's degree, and a clinical certification that helps them find employment. Yet another program hires community health workers who serve as liaisons between the health system and the community. Finally, the Henry Ford Health System participates in a variety of efforts to improve the quality of life in the community, from hosting public movie nights to supporting the creation of a large mosaic by 1,300 individuals from across Detroit. "We are trying to bring connectivity to Detroit and empower the individuals within the city," Wisdom said, "but also to bring beauty and art to our communities as well."

DISCUSSION

John Balbus of the National Institute of Environmental Health Sciences opened the discussion session by asking the speakers to comment about how the work that they are doing in empowering the community is being reflected in the institutions of the city of Detroit and how it is leading to a sustainable transformation of the status quo and the way in which things are done.

Wisdom answered that one of the ways is through the efforts to employ community health workers. "This is not something that many of us in health care have heard about, particularly those on the clinical side," she said. Bringing these workers in to help those in the health care industry engage community members is one example of a transformational change.

Davis approached the question from a different angle: "Our effort actually is being led by a grass roots community group, which is transformational in itself," she said. Depending on the particular issue, different groups are taking the lead in looking for solutions, but none of those groups are composed of people whose salaries are being paid by organizations that have some interest in the status quo, so it makes it easier for them to "speak truth to power," Davis said.

Wisdom added that another example is that the Henry Ford Health System is working closely with three other health systems—the Detroit Medical Center, Oakwood Health Care, and St. John Providence—even though they compete for market share. Cooperating with them on community improvement efforts is transformational, Wisdom said. Yet another example is the way that the health system is taking a "collective impact approach," bringing together all of the stakeholders affected by a particular issue and using a multisectoral approach to address the problems. "We can't address them the same way by being in our silos," she said. "We have to come together at a common table with that shared power in order to truly drive change."

In response to a question from Jack Spengler of Harvard University, Wisdom said that the Henry Ford Health System has a very robust program to drive down the company's health care costs by encouraging its employees to change their behavior in ways that improve their health. Employees are given health risk appraisals and then offered suggestions for changes in behavior and lifestyle. "We see a direct correlation," she said. "When our scores go up related to our lifestyle risk score, we also see that it increases productivity and it decreases costs." The health system is also interested in taking what it learns from working with its employees in this way and applying those lessons in the broader community, Wisdom said.

Brett Van Akkeren from EPA commented that one of the reasons that groups of artists moved to and thrived in Soho in Manhattan was that the government there was ineffective and did not enforce its zoning laws. This allowed artists to populate Soho, even though it was supposed to be an industrial area. "So you've got to make sure that government stays out of the way sometimes and lets people be creative," he said.

On a different subject, Van Akkeren said that he had found, when working on community development with EPA, that in many communities the health care systems—and particularly hospitals—are wonderful civic institutions but lousy neighbors. "The reason," he said, "is that often we

have medical campuses that are isolated from the rest of the community, and they create barriers in the community in much the same way that freeways create barriers in communities." One area in Chattanooga. Tennessee, that he was familiar with had 9,000 medical jobs, but the area was a food desert. There was one restaurant, he said: Kentucky Fried Chicken.

Furthermore, Van Akkeren said, although hospitals themselves offer food, they are generally not designed so that the hospital's neighbors can use the food services. Thus, he said, he was very impressed with what the Henry Ford Health System was doing with its new 300-acre development, at least judging by the renderings that Wisdom showed. "I liked that you guys had a grid that was open to the public," he said. "I liked the fact that I saw things that looked like potential cafes on the first floor of the buildings. I would like to hear a little bit more about that."

To illustrate what the Henry Ford Health System's newer developments are like, Wisdom described a new health system hospital built in one of Detroit's suburban areas, West Bloomfield. "It looks like a northern Michigan lodge. Every room is private. You walk in and you wouldn't even know it was a hospital. . . . In this hospital is a community center where people come to play cards, they come to eat the food. All the food is prepared fresh; it's organic. Some of it is grown in our greenhouse. Henry Ford Health System actually employed a full-time farmer. People see that as a place to come, to congregate, to enjoy themselves and enjoy the food. We actually even have weddings at the hospital. . . . Talk about being transformational! . . . People love to come there not only when they are sick, but they come when they are healthy."

Chris Leinberger, a real estate developer who runs the graduate real estate program at George Washington University in Washington, DC, offered some background on walkable urban places and how Detroit compares with other cities. He and colleagues did a survey of the 30 largest metropolitan areas in the country, ranking them in terms of walkable urbanism, and Detroit ranked 22nd out of 30. However, the group also looked at future indices and how the cities are expected to change in coming years, and Detroit jumped up to number 8 on the list. "It has the second highest market capture of walkable urban development in the country," Leinberger said. "In this real estate cycle, it has basically stopped sprawling. It is too early to say if that is going to be a long-term policy or long-term market trend, but we are seeing that now."

More generally, he said, most of the metropolitan areas either have stopped sprawling or are expected to stop sprawling in the next decade. With this new trend, 80 to 90 percent of all development is likely to take place in less than 10 percent of the existing land mass of the various metropolitan areas. That does raise a couple of questions, he said. First,

what should be done with the remaining 90 percent of urban land, which is no longer seeing much new development? Second, will gentrification drive low- and moderate-income people out of these new walkable urban places? "We need a conscious social equity policy," Leinberger suggested.

Harold Zenick with EPA said that he had observed over the past two decades that two groups, disadvantaged communities and those interested in sustainability, were often at odds and even confrontational. "The disadvantaged communities look at the sustainability people and think they have their heads in the clouds," worrying about what is going to happen over the next 10 or 20 years, whereas the people in disadvantaged communities feel they need their problems solved now. "The sustainability community says, 'Well, you are too narrowly focused; you're looking oftentimes at symptoms and not causes, and the solutions you come up with are not sustainable.'" Thus, Zenick asked the panelists if they had seen any lessening of those tensions or if they still exist.

Kinkead answered that Detroit is dealing with circumstances that make collaboration both absolutely necessary and also fraught. "Detroit is a city that is 83 percent African-American," he said. "It's a city that has struggled mightily with civil rights issues in the past." Thus, there is a great deal of sensitivity about equity, and collaboration in Detroit can be a struggle at times. However, robust and dynamic civic engagement processes exist in Detroit, with the various stakeholders clearly stating their positions and no one holding any punches. Thus, although it has not been easy, Detroit has been able to work through things and come up with a focused growth strategy for the city.

"As we go forward, particularly as the city comes out of bankruptcy and you see reinvestment really surging in the city, it's going to be really important to watch Detroit over the next 6 months to see how we navigate this terrain," he said. "In the past, for every $10 we had in the city, $4 was going to debt service. When you eliminate that burden, you can begin to actually do things; you can push things forward in a way you haven't in the past. I think we have the opportunity now to do things which produce a much more dynamic and thriving city, but one that actually reaches out to everyone, and that is where we are pushing."

Jackson then requested that each of the three speakers provide a memorable story about how some kind of transformation occurred—a concrete example of how something actually happened.

Wisdom spoke about the appallingly high death rate among infants less than 1 year old in Detroit, which she said is comparable to the rates in some developing countries. A task force was assembled in 2008 and 2009 to develop a plan to reduce these rates. The Kresge Foundation, PNC Bank, the Robert Wood Johnson Foundation, and the W.K. Kellogg Foundation

provided $2.2 million in funding over 3 years to engage community health workers and address the mortality rate.

"In the same neighborhoods where we saw these appallingly high rates," Wisdom said, "we have had 200 babies born over the last year and a half, and we had zero deaths. It has transformed our communities not just because we see infants not dying, but we see women who are gaining employment, who have gained better housing, transportation, access to food, and are in a much more self-sustaining position so that they can then be part of the problem solving and part of the solution in the communities. That is what I consider a transformational story."

Davis described how in February 2012 the mayor of Detroit, looking at an emergency financial manager coming in and facing the possibility of bankruptcy, took the bold step of announcing what services he felt were true municipal services, things like public safety, lighting, and garbage pickup. Public health was not on the list, and the budget for public health was zeroed out. Davis was the health officer for the city at the time, and she took this as a challenge to create a new way by which public health would be delivered in Detroit through a public–private partnership. "We weathered the storm of privatization," she said, "and in that first year, in many cases, we were able to improve the quality and the quantity of services being provided to the residents of the city while relieving the city of the ever-growing financial burden" of maintaining a health department. "Now, as the city comes out of bankruptcy and is wanting to regain some of those services, it allows us to enter into a new and stronger relationship with some of our other community providers. So we were pleased to be able . . . to stand there in the gap and not only maintain the public health system but enhance it, and then be able to turn over what is a better system, now that the city feels it is ready to take those services back."

Kinkead spoke of the fact that many of the foundations that have played a major role in Detroit's recovery had their roots in a system that led to Detroit's problems in the first place. The Ford Foundation's original endowments came from Henry Ford, whose fortune was dependent on mass consumption and massive divisions of labor. "These institutions enabled one another, particularly in the first half of the 20th century," Kinkead said, "and they allowed Detroit to grow rapidly—perhaps too rapidly—and, arguably, unsustainably." The foundations that derived from those companies now have absolutely nothing to do with those original corporations, Kinkead pointed out, but they have been present to help in the city's recovery, a true long-term transformation. "Somehow, there is some sort of sublime redemption in that, I think."

In particular, he pointed to the "grand bargain" that prevented the Detroit Institute of Arts, which had been owned by the city, from being forced to sell off a large percentage of its collection to pay off the city's debts.

Philanthropic leaders from the Community Foundation for Southeast Michigan, the Ford Foundation, the Knight Foundation, The Kresge Foundation, and a whole host of others came together around a strategy that saved public workers' pensions while protecting the arts institute by putting it in the hands of an independent charitable trust. The foundations' generosity helped put the city on a more sound financial basis without sacrificing the art that had been accumulated through the wealth of the industrial revolution in Detroit. "That is transformative," Kinkead said, "and I'm very excited about where it leads us now."

REFERENCE

IOM (Institute of Medicine) and NRC (National Research Council). 2009. *Local government actions to prevent childhood obesity*. Washington, DC: The National Academies Press.

4

Transforming New York City

The workshop's third session focused on the public health efforts that have been part of the post–Hurricane Sandy rebuilding program in the New York City area. In October 2012, Hurricane Sandy struck the Northeast and the Mid-Atlantic regions of the United States, causing unprecedented damage. The economic losses were an estimated $65.7 billion, making Sandy the second-costliest storm in U.S. history. More than 650,000 homes were damaged or destroyed. The session's single presenter, Nupur Chaudhury, Rebuild by Design's senior project manager, described a subset of the competition's winning projects and discussed how health considerations are being integrated into those efforts. In particular, she focused on an example of what she called "a community approach to postdisaster reconstruction."

REBUILD BY DESIGN COMPETITION

In the aftermath of the storm, President Barack Obama's Hurricane Sandy Rebuilding Task Force and the U.S. Department of Housing and Urban Development (HUD) diverted from the traditional approach to rebuilding and facilitated an international design competition to determine the best designs for rebuilding in the region affected by Hurricane Sandy. What made the competition particularly unique, Chaudhury said, was that at the beginning of the competition, the design teams were not asked to solve problems in any predefined area or to solve any specific issue; instead, the groups were tasked with codefining the problems, and only once they defined the problems did they come up with solutions for the problem or problems that they had identified. Before the process got started, HUD committed to using money from community development block grant funding to fund the implementation of the winning designs.

The competition was overseen by Rebuild by Design, a collaboration between various government entities—HUD and the governments of the

states of Connecticut, New Jersey, and New York—as well as several essential private partners. "The competition was cocreated with the Municipal Art Society of New York, who is experienced in communities in New York City," Chaudhury said. "The competition was also cocreated by the Van Alen Institute, who brought their experience in running competitions, specifically, design competitions. The Regional Plan Association was able to ground the competition in the relevant regional issues, and NYU's [New York University's] Institute for Public Knowledge provided the research base." Chaudhury noted that the Institute for Public Knowledge is headed by Eric Klinenberg, author of the seminal work *Heat Wave: A Social Autopsy of Disaster*, in which he discussed how a lack of social connectedness exacerbated the effects of the 1995 Chicago heat wave and led to far more deaths than would have occurred in a more socially cohesive place (Klinenberg, 2002). "So, having the Institute for Public Knowledge on the team was invaluable," Chaudhury said.

The first step in the competition was a request for proposals, which was a call for interdisciplinary teams to address the question of how best to rebuild after Hurricane Sandy. The goal was to find not only teams that were composed of creative and competent designers but also teams that were created and organized in innovative ways to facilitate thinking outside of the box and lead to innovative solutions to rebuilding the affected communities. One hundred forty-eight teams applied, Chaudhury said, and with no other information than that they would be working on the Sandy-affected region, they had to prove themselves and show that they were up to the task.

Of those 148 teams, 10 were selected. Those 10 teams were tasked with working with the communities in the Sandy-affected region to come up not only with an understanding of what the problems were but also solutions to those problems. From the very beginning, the teams were required to show that their proposed solutions had the support of the affected communities, Chaudhury said, "because these communities were the communities that were supposed to be protected by these projects."

Over the course of 9 months, the 10 teams worked in the region to decide on a set of problems and come up with a set of solutions. "These teams consisted of architects as well as engineers, artists as well as scientists, urban designers alongside water experts," Chaudhury said. "They were required to look at architecture. They were required to look at the landscape. They were required to look at the urban design issues as well as the urban planning issues that were at play in the Sandy-affected region." Further, she said, they were required to look at the entire region and have an understanding of how the interventions, thoughts, and ideas

that they would propose would affect the region as a whole rather than just one specific place." The key to the Rebuild by Design competition, Chaudhury said, was the development of a coalition with the key stakeholders in the region.

The first 3 months of the competition were devoted to what Chaudhury described as a "research sabbatical," in which the teams worked with members of the communities to codefine the problem. "Usually what happens is that the problem is already defined," she said. "To have the teams selected and then to spend 3 months of the competition to codefine the problem itself was something that actually had never really been done." The teams spoke with people in such areas as Asbury Park, New Jersey; Bridgeport, Connecticut; and Red Hook, New York, to understand what the effects of Hurricane Sandy had been and also to gain insight into the broader problems that the various areas faced.

"Some of the local mayors were a part of this research sabbatical, which was extremely rare," Chaudhury said. "There were design teams that were actually working in soup kitchens to get an understanding of what the communities had to face and what they had to struggle with post-Sandy."

After that research sabbatical, the teams engaged in a 4-month collaborative design process. Chaudhury explained what that process entailed: "These design teams created these comprehensive coalitions that consisted not only of traditional design teams but also local stakeholders. They invested a significant amount of time to make sure that they had the right stakeholders at the table to work alongside of them. They understood all of the previous plans and efforts in each of the communities. It wasn't that they were just helicoptering in and coming in with an idea. They were required to look at all of the past plans, all of the planned past vision documents, and to really think about what was going on prior to Sandy and make sure that that was integrated—or at least acknowledged—for their final proposal."

A significant part of the final score in the design competition depended on how much input that the community had in the design, Chaudhury said. The committee scoring the competition looked at the design proposals created prior to the community collaboration and at how much the proposals changed after the teams had worked with the community. "Having these design teams know that they were being scored as to how much they were collaborating really was a game changer for this competition," she said.

Furthermore, the design teams were required to create nontraditional events for their community collaboration with the goal of capturing broad participation from these communities. In Hunts Point in the Bronx,

for instance, the design team hosted a "slam bake" cooking contest. "Hunts Point is one of the major food distribution centers in the region," Chaudhury explained. "It made sense to have a cooking competition there and have judges decide on what food is the best and then talk about what it meant for Hunts Point to be a food distribution center in the wake of Hurricane Sandy." In Bridgeport, Connecticut, the design team hosted a bike tour and then had a discussion following the bike tour to engage young people in the community and hear their ideas concerning the future of Bridgeport. In Asbury Park, New Jersey, which Chaudhury described as a "heavily divided" community, the design team facilitated an effort in which the community worked together to create a parade from two different places within the neighborhood; after the parade the design team hosted a discussion in which people talked about what they thought the future of Asbury Park should look like.

In total, Chaudhury said, the 10 design teams collaborated with 535 different organizations, 64 communities, 181 government agencies, and 141 neighborhoods and cities.

Of the 10 teams, 6 of them were selected to continue developing their plans, with a total of $930 million from federal disaster funds ultimately being allocated. Chaudhury briefly described four of the winning proposals.

One was put together by a group called The BIG Team, which focused on lower Manhattan. "The question they were really trying to answer for lower Manhattan," Chaudhury said, "is how is a wall not a wall? They engaged with multiple communities in the lower Manhattan area to think about how could they prevent walling off Manhattan and how this wall—or this berm, actually—could be a piece of infrastructure that responded to each of the communities." In the submitted proposal, called "The Big U," the wall served as a community space in one area, a bike path in another, and a park in yet another. Chaudhury said that what they did was take into account what each community wanted for its neighborhood and created a comprehensive strategy for that area.

A second team focused on the Meadowlands in New Jersey. The question that the MIT/ZUS Team asked was, "How could they turn the area's backyard into its front yard?" The Meadowlands area consists of different towns and counties, all of which back onto a wetlands area. The goal was to recognize that area as an asset and find a way to have these communities turn toward the wetlands. "Their proposal proposed a berm that actually creates a mechanism for economic development and spurs new jobs, new housing, and thinking about a regional park," Chaudhury said. One small part of that vision, for example, was the establishment of a fish restaurant that faces the water and serves local fish.

Yet another team worked on the Jersey Shore to protect the tourist industry there, which is one of the area's economic engines. "They created a comprehensive plan to move the tourism inland toward the Pine Barrens," Chaudhury said, "taking off the pressure of rebuilding the shore itself, which essentially would be rebuilding in places that would be hit by a storm again in the future."

A fourth team put together a proposal for Hoboken, New Jersey. In a big storm, Chaudhury said, Hoboken "essentially functions as a bathtub." Thus, the team was looking to develop a comprehensive strategy to deal with water that would, according to the title of their project, "Resist, Delay, Store, and Discharge" water in moments of crisis.

Chaudhury also showed a 10-minute video describing the work of the design team that collaborated with the communities in the area of Hunts Point in the South Bronx, New York. South Bronx is the poorest congressional district in the United States, Chaudhury said, and it has the highest rate of asthma in New York City. But it is also a key distribution point for much of the food that is eaten by the inhabitants of New York City and parts of New Jersey and Connecticut. Even though so much food passes through Hunts Point, the South Bronx itself is a food desert, with the inhabitants of the South Bronx having much less access to fresh foods than people in the rest of the region.

Hunts Point was not damaged by Hurricane Sandy as much as other parts of the region were, Chaudhury said, but the hurricane still highlighted the area's vulnerability. If Sandy had come through at high tide rather than low tide, much of Hunts Point—including the food that is kept there and the trucks that distribute it throughout the region—would have been under water, and the entire area's food supply would have suffered because of it.

With all this in mind, the design team's proposal—as influenced and directed by community input—focused on two overarching goals: protecting the physical infrastructure of the area in the case of another major storm like Sandy and helping improve the economy and health of the local communities.

The first goal was addressed through integrated flood protection and improvements in the maritime supply chain. The second was addressed through a two-pronged approach. The first prong was focused on livelihoods and providing good jobs in the community. To do this, the plan called for carrying out the project's construction in a hyperlocal way, Chaudhury said. "What materials could actually be created in the South Bronx area? What types of construction would actually employ the local community?"

The second prong was focused on the health of the local communities. The high asthma rate in the area—25 percent of the schoolchildren in

Hunts Point have asthma—is due to the huge numbers of trucks carrying food that come in and out each day. An estimated 15,000 to 20,000 trucks go through the Hunts Point area on a weekly basis because of the food distribution center, Chaudhury said. So the plan examines a variety of ways to limit the effects of the trucks passing through. It also calls for keeping some of the fresh food—produce, meats, and fish—that passes through the area for the local population by creating local markets. "I actually think that the community itself, without actually saying it, was really talking about the social determinants of health," Chaudhury said.

Concluding her presentation, Chaudhury said, "I think the biggest takeaway that I want to emphasize here is that because of the competition, it allowed for the space and place for the communities themselves to cocreate. Communities . . . not only know the problems themselves, but they actually know the solutions." What is required, she said, is to find a way not only to highlight those community voices but also to have them lead the design and the proposals themselves.

DISCUSSION

Richard Jackson from the University of California, Los Angeles, spoke of how some local oysters and other seafood—which once made regular appearances on the region's tables—are now off-limits because of pollution in many local bodies of water. He asked if the mitigation efforts in response to Hurricane Sandy might clean up the pollution enough that these local food sources once again become available.

Chaudhury said that, yes, that is a reasonable expectation. In particular, she said, one of the winning proposals was put together by a team that included a group called the Billion Oyster Project. That group worked with local oyster farmers to consider what is going on in the water off Staten Island and how to use the cultivated oyster beds to act as living breakwaters to help protect the coast from storm surges and sea level rise.

Lynn Goldman asked for more details about the competition and how the proposals were selected for funding. She also said that she would like to hear more about how Connecticut, New Jersey, and New York were able to put the funding together to hold the competition.

Chaudhury replied that the funding for the projects themselves—the $920 million—came from block grant disaster recovery funds from HUD, but the support for the process of selecting the projects came from a number of sources, including the JPB Foundation, the Rockefeller Foundation, the Surdna Foundation, and others. Now that the projects have been selected, the lead supporter for the implementation phase is the

Rockefeller Foundation. That funding pays for Rebuild by Design staff to oversee the projects and, for example, make sure that they are true to their initial plan and design.

As for how the projects were scored and which projects were chosen as the winners, Chaudhury said that although there were closed-door deliberations, one major consideration was community engagement: How did communities cocreate? Was their contribution actually a piece of the final proposal? Another consideration was whether or not the projects could be replicated. The goal all along for these projects has been not only that they be successfully implemented in these six original areas but also that they provide the sorts of building blocks that can be applied in other places.

Jackson commented that the way the designers had to work with the community to develop the proposals represented a major cultural shift, because architects and other designers are used to figuring out what they want to do on their own and then telling others what to do to carry that out. Chaudhury agreed and described the sorts of encounters that this new approach led to. Imagine someone who has lived in this community for years and whose parents and grandparents have lived in the community for years sitting at a table next to a Dutch architect who has by his side a translator, who is next to an artist, who is next to a water engineer. All of these people must work together to think through the issues carefully, determine what the problem is, and then come up with a solution that can actually be implemented. That is a true culture shift.

One audience member asked Chaudhury what the plans were for keeping the community groups involved for the 5, 10, or 15 years that it will take to get these projects to their final stages. "The Rockefeller Foundation is not going to keep funding this forever. How are you going to keep that going for the long term?"

Part of the answer, Chaudhury said, is that the lead community group is THE POINT Community Development Corporation, which has been in the area for 20 years. "I don't think they are going anywhere." Because the residents and the various community-based organizations actually bought into the plans and had an integral part in their development, it is much more likely that they will remain motivated to make sure that the plans are true to the proposals that they helped create. Furthermore, she said, most of the community-based organizations had never really thought about resiliency until the aftermath of Hurricane Sandy, but now, thinking about these plans has led them to integrate the concepts of resiliency and resiliency planning into their everyday work.

Next, Jack Spengler of Harvard University asked about the role of local wisdom in developing programs like the one that Chaudhury had

described. While he acknowledged that such local wisdom is important, he suggested that it is also limited and cannot provide all the answers.

Chaudhury agreed and said that this observation points to one of the strengths of the competition. "It actually wasn't just local communities saying what they wanted and designers and architects putting that together," she said. "The cocreation of it actually meant that designers and architects who were experts both internationally and nationally were saying, 'We did this project in the Netherlands, and here is what happened. Do you think that that would work here?' or 'We actually worked on a project down South. Here is what happened. . . . Do you think that would make sense in this community?'" The key was that the global knowledge and insights of the experts were combined with the local knowledge and insights of the community members to come up with solutions that were informed by outside experiences but guided by what the local people knew and what they wanted for their community.

An audience member who identified herself as working for a consumer products company commented that the company uses cocreation in the development of its products. "We rarely go into the lab anymore and create a product without an incredible amount of what we call 'lead users,' which I would call your citizens lead users, the people that live it, use it every single day." But it is also important to keep these cocreators involved throughout the entire process, she said. "What we have learned in our space is that they are the best advocates. They are also your harshest judges, but you want them to judge you harshly. You want them to tell you the truth."

Chaudhury agreed. "It is important to have these communities work alongside of you so that they can tell you like it is not just during the creation of it but during the implementation," she said. So part of what the Rebuild by Design team is doing during the implementation phase is updating the communities at different key points in the process. The team also tries to keep the communities engaged as the projects move forward, recognizing that they were cocreators of the projects. Finally, the team is working to create a network of the competition-winning communities so that they can exchange information and lessons from their experiences.

In response to a question from Jackson, Chaudhury spoke about how such crises as Hurricane Sandy can turn out to be moments of transformation. In general, the plans that have been developed under Rebuild by Design do more than just come up with ways to create protection for the next storm that comes along; they also take the opportunity provided by this moment of crisis to rebuild stronger. An example is the proposal by one of the plans to create a farmer's market that will be accessible to community members 6 days a week in an area where for years there had been only a large food distribution center that

did not offer the local people any sort of access to fresh produce, fresh meat, or fresh fish.

REFERENCE

Klinenberg, E. 2002. *Heat wave: A social autopsy of disaster*. Chicago, IL: University of Chicago Press.

5

Cross-Cutting Issues That Face All Urban Environments

In the workshop's fourth session, a panel of three speakers discussed some cross-cutting issues that arise in efforts to improve community health in urban areas across the United States and, in particular, in the three cities that were the focus of the workshop: Washington, DC; Detroit, Michigan; and New York City, including surrounding areas in New Jersey and Connecticut.

Session moderator Lynn Goldman, dean of the Milken Institute School of Public Health at George Washington University, opened the discussion by offering a few of her own observations. In listening to the day's case studies, Goldman said, she was reminded of the problem that doctors face in the development of new and novel treatments. That is, although there is often a lot of support for the development of new therapies—from the National Institutes of Health, for example, or from various private companies—there is much less support for the necessary next step of seeing that new, effective treatments are adopted widely by the medical community. "Even when we find new therapies," she said, "it is not easy to scale them out. It is not easy to spread them among different practitioners. This has wound up being a major challenge in medicine: improving the quality of medical care and bringing evidence-based medicine to the forefront in terms of how we perform as doctors."

There is a parallel between this situation and the situation faced by those trying to improve the health of communities, she said. "Today we have heard about several approaches that are very exciting and very novel, new approaches that have received quite a lot of support from many funders. . . . In thinking about this last session, one of the things that I would like us to think about is how we both scale up and spread some of these practices to other communities. It is very difficult to do this in the context of medicine, [and] when you are talking about communities, it is even a more complicated problem."

Several factors make the community health problem so complicated, Goldman said. One is the sheer number of people involved. Although doctors deal with individual patients, community health practitioners are dealing with thousands or millions of individuals who are going to be affected and who also need to be engaged and involved in the public health efforts. "One thing that we heard in common between all of these processes," Goldman observed, "is that one way or another, they always have a tremendous amount of engagement and involvement of the communities." A second complicating factor is that the environment in which public health efforts take place varies from community to community, so there will always be questions about just how applicable a particular approach is in a given community. What works well in one community may not work so well in another. A third issue is the level of evidence that exists to support the various community health efforts, Goldman said. "Where are the data that prove that public health benefits from these actions? We have models that indicate there may be a financial payoff or a public health payoff, but where are the actual data that prove that there is an actual benefit?"

Finally, Goldman said, there is the issue of the framing and communication of these public health efforts. How does one get the word out to people outside of the region in which the successful efforts are taking place? "In medicine, we suffer from an assumption that if we have a better practice, it will just spread," she said. "People will just learn about it. It will just spread. What we have learned is that that is not true. It doesn't happen that way. In fact, there is not an automatic spread of better practices. Even if they are much, much better for patients, save a lot of money, any metric that you can use, they don't spread automatically." It seems likely that the same thing will prove to be true for community health, she continued.

"One thing that we can think about at a later time, in terms of the Roundtable, is the role of an organization like the Institute of Medicine in helping to scale up and spread these kinds of efforts, whether it is through our own efforts and holding a workshop like this or perhaps in helping to form what in medicine we call 'learning communities.'" Such learning communities, Goldman explained, bring people together to learn from each other's experience. These can be city planners, transportation planners, community groups, or other groups interested in improving community health and willing to learn from each other about what has worked in different situations. The bottom line, she said, is that it will be a major challenge not only to identify best practices in community health

but also to figure out how to spread those best practices so that they are taken up by as many communities as possible.

DESIGNING FOR HEALTH

The first panelist was Matthew Trowbridge, a physician and an associate professor in public health at the University of Virginia School of Medicine. In his research he has studied the impact of the built environment on public health and, in particular, how health-promoting design strategies can support active communities and reduce the incidence rates of childhood obesity.

Trowbridge began his presentation by offering some details about his background and his perspective on the field of public health. "I was trained as a physician," he said. "I am a pediatrician but also a preventive medicine physician—I have a master's in public health." Like pretty much everyone in his field, he said, he was trained "in the core ideas of environmental health in the old-school manner." In particular, he said, doctors are trained to think of environmental health in a particular way that reflects the successes of the past: "Physicians sit in their offices, see a patient come in with a constellation of symptoms and think maybe there is an environmental toxin and go out, find the toxin, and remove it. Similarly, we have been doing it with things like lead paint—again, waiting in our offices, seeing a constellation of symptoms, going out, finding something, removing it."

However, he said, doctors are beginning to realize that some environmental health problems are really different. They are not so amenable to that old model. In response, physicians and public health practitioners are beginning to approach their tasks proactively and to look for ways to encourage individuals to engage in healthful activities, particularly through the design of buildings and public spaces. Interest in this approach is now growing among both health professionals and the general population. "We have to harness that," he said. "Obviously, everybody in this room understands that. Again, how do we respond as people are asking for action, asking to move forward?"

One of the most encouraging approaches, he said, is the collaboration between public health practitioners and designers, epitomized by the publication of Active Design Guidelines: Promoting Physical Activity and Health in Design by the New York City Departments of Design and Construction, Health and Mental Hygiene, Transportation, and City Planning (Lee, 2011). The ideas in the book are not just theoretical,

Trowbridge emphasized, as they have been put into practice in various New York City projects, such as the transformation of Broadway into a more pedestrian-friendly thoroughfare that encourages walking. Perhaps the most dramatic example is the development of the High Line, a former railroad spur through the Lower West Side of Manhattan that has been turned into a 1.45-mile-long linear park.

"One of the things I love about the High Line," he said, "is not just that it exists, which is amazing, but also, if you walk along it, every moment of it is highly designed and unique. This was not just a utilitarian park. The landscape architects really got to show what they can do." One of the lessons of the High Line Park, he said, it that good design is critical to the success of such efforts. "The High Line compels you to walk along the entire thing because you keep getting surprised. It is contextually appropriate. It is exciting." The question that remains, however, is how to bring that approach to scale and to deliver such an effect to everyone in a community.

It is not just New York City that has been creating such health-friendly environments, he said. He mentioned Detroit and Nashville, Tennessee, as examples of the places all around the United States that are doing this sort of development. "And people are responding," he said. "People are having an amazing time utilizing these amazing new spaces."

This is not happening by accident, Trowbridge emphasized. "People are trying to figure out how to do this," he said. "There are people on the ground turning these places into reality."

As an example, he described the creation of a health center in Nashville. The city's medical officer came across the idea of active design and decided to incorporate it prominently in the health center. Instead of hiding the stairs, for instance, he gave them a place of prominence in the design as a way of celebrating and encouraging physical activity. "As the users of the building got excited about the idea of active design," Trowbridge said, "they started asking for more." Because the designers had planned the building to take advantage of natural lighting, there were no offices along the outside, but instead there was a walkway along the outside that people were naturally drawn to. It was like a walking track, he said. "But the users came back to the architecture firm complaining, 'You are giving us a semicircle. We need a full track.'" So the architects decided to do a bridge across the top of the lobby to complete the circle. Previously, they had assumed they would not have gotten approval for the bridge, but because it was now

being presented in terms of active design, as a way to encourage people to walk around the outside of the building, they got their approval, and it was built. "Now, there are actually lunchtime walking meetings going on inside of a Nashville health clinic," Trowbridge said.

"The cool part is there was so much success for that [active design element] that they are going to be getting a bike-share station out here, which was not originally part of the plan." A moment of opportunity for creating such things now exists, he said. "These places are starting to happen, there are tools that people can pick up and utilize, . . . but we have to keep making more of that."

It was this idea of a "moment of opportunity" that inspired Trowbridge to carry out his current work on childhood obesity, he said. Working through an interagency personnel agreement between the National Institutes of Health and the National Collaborative on Childhood Obesity Research, Trowbridge has been looking to develop design tools that can help in the fight against obesity. He began by asking, "Who else in this sphere is pretty good at taking concepts like health and making them matter in the market?" Although he knew nothing about green building, he recognized that the green building industry has been successful at this sort of thing, so he ended up leading a collaboration among the National Collaborative for Childhood Obesity Research, the U.S. Green Building Council's Center for Green Schools, and the National Academy of Environmental Design. "We convened a workshop and a set of papers, all focused on merging the kind of market transformation capacity of green building with emerging evidence from public health," he said.

The idea that the green building industry might be able to help in creating healthy buildings and environments generated enough excitement that the Robert Wood Johnson Foundation provided funding to keep the work going. Thus, for the past 2 years Trowbridge has been working with the U.S. Green Building Council to lead the Green Health Partnership, which is seeking to use some of the marketing tools developed for the green building industry to encourage the design of buildings for health. The partnership has three objectives, Trowbridge said: (1) to provide thought leadership at the intersection of the green building industry and public health, (2) to develop prototype practical and scalable health metrics based on existing components of the LEED[1] green building rating system, and (3) to demonstrate the integration of

[1] LEED is a green building certification program developed by the U.S. Green Building Council.

these health metrics within U.S. Green Building Council products and tools.

"Basically, what we have realized," Trowbridge said, "is what we are really all trying to do is to make healthy places investable. That is what the green building industry has done so well. They have made green something that the market can measure and, hence, can invest in. If we can use that as a frame, we can start getting somewhere with health as well, at least from the perspective of scale-up and using some existing partnerships like green building."

To learn more about the intersection between the green building industry and public health, Trowbridge had two graduate students study the LEED program in depth. "Our goal was to look at where health is referred to within LEED, how consistent the health language is within LEED, and how health-related strategies are currently used," he said. What they discovered was that health concerns run throughout LEED.

"We found health- and wellness-related credits and intents in every LEED credit category," he said. However, LEED uses a wide range of terminologies to describe health-related issues, and much of that terminology is different from what is used in the public health field. Thus, people in the public health field may find it difficult at first to communicate effectively with people in the green building industry.

More importantly, Trowbridge's analysis of LEED-certified buildings showed that there is plenty of room for improvement in terms of meeting health-related goals. In particular, he and his colleagues examined how many of the various health-related credits used in LEED certification are now being achieved in LEED-certified buildings. He found wide variation, with some buildings receiving most or all of the health-related credits in their LEED scores and some receiving only one-quarter to one-third of the possible health-related credits. "The variance of whether the health-related credits are currently being used is wide open," he said. "What does that mean? It means that we have a really powerful potential partner for scaling up health: the green building industry. There are some health-related credits waiting to be utilized, but currently they are not really being utilized in any sort of directed way."

Trowbridge cautioned that not everything in LEED makes a perfect health measure. "No, I think what we do have is a nice vision for how you could use a really powerful new set of partnership tools and a group that has a leadership position in the real estate market. They are very excited to engage with us."

He closed his presentation by saying that he is seeing a "swell of interest" in the topic of community development and public health. Indeed, the most recent issue of *Health Affairs* before the workshop focused on that very issue.[2]

Discussion

Frank Loy opened the discussion session by asking Trowbridge to say some more about the health and wellness metrics that might be used by the real estate industry to put a value on various health- and wellness-related design elements. "Until we develop those, it is going to be hard to push them, to insist on them, to credit them, [and] to judge the effectiveness of them," Loy said.

Trowbridge answered that the development of those metrics is a task that still needs to be done. "No one is sitting off quietly with a secret set of the perfect health and wellness metrics for the real estate industry at this moment," he said. "I am not claiming to have them either." He indicated that in an article he wrote for the special issue of *Health Affairs*, he established a set of performance criteria that health and wellness metrics would need to satisfy to be useful for the real estate industry. "Some of the criteria are things like making sure that they are actionable," he said. "We don't always deliver metrics like that in public health. They also need to be mutable; that is, the actual developers or the architects have to have a chance or feel empowered that they could actually shift the metrics that you are handing to them." Another criterion deals with the scale of the effect that one expects. "No developer wants to be on the hook for changing obesity rates at the county level with . . . one building," Trowbridge said. "We have to figure out how to get them down to a scale that they can deal with."

The metrics also need to be practical. "The infrastructure [used] to gather data is expensive," said Trowbridge. The gathering of data is also time-consuming and is not a core competency of many people in real estate, he suggested. Thus, it will be important to find new ways to gather data for the metrics. "I think there needs to be a new science—a lot of thinking on how to utilize the pros and cons of crowd-sourced data and things like that, but with a focus on making those data easier for a developer to gather." Finally, he said, the metrics need to be valuable "in the sense of being relevant to the investors."

[2] See http://content.healthaffairs.org/content/33/11.toc (accessed August 4, 2015).

A key point to keep in mind, Trowbridge added, is that decisions about which metrics to use will inevitably influence what one gets over the long run. People will design in ways that satisfy the health and wellness goals that are captured by the metrics but not necessarily other goals that are not represented in the metrics.

"A big part of the success of green building has been in creating an opportunity for competitive differentiation projects," he concluded. "Health and wellness [are] really rapidly emerging as the new potential competitive differentiation." This is something that people interested in public health should leverage, he said, but it will be important to move fairly quickly, as the real estate industry is already moving in this direction.

Richard Jackson of the University of California, Los Angeles, mentioned a report published in 2013 by researchers at the Massachusetts Institute of Technology in which the authors argued that there is no silver bullet for healthy communities.[3] "Howie Frumkin and I were pretty upset with that,"[4] he said. "There is a silver bullet. It is walking. It is the one thing. People need to walk, walk, walk, and then they need to walk some more."[5]

He then introduced Sarah Hammerschmidt from the Urban Land Institute, noting that the institute has been looking at the business case for healthy communities.[6] Hammerschmidt told the workshop audience that she and the institute have a new report coming out that was prepared in partnership with the Center for Active Design, which created *Active Design Guidelines* (Lee, 2011). The new report, Hammerschmidt said, offers a set of 21 strategies that developers can use in projects from individual buildings to community-scale developments, and all of these strategies have been shown to lead to improvements in health (Urban Land Institute, 2015).

Trowbridge responded to Jackson's comment by saying that he firmly agrees that walkability is an important metric to employ. Referring to a book by Jeff Speck, *Walkable City*, Trowbridge said that Speck comes to the same conclusion (Speck, 2012): "If you had to

---

[3] See http://news.mit.edu/2013/3q-alan-berger-on-cities-and-health-1121 (accessed September 15, 2015).

[4] See http://www.scribd.com/doc/217720272/Report-on-the-State-of-Health-Urbanism-A-Critique (accessed September 15, 2015).

[5] The U.S. Surgeon General recently released a report on this subject (HHS, 2015).

[6] See, for example, Kramer et al., 2014.

choose one metric, it would be walkability." However, Trowbridge said, it will be important to figure out what the other big metrics should be, in addition to walkability. "I don't know what they are perfectly yet, but we need to capture some of the other domains as well."

John Balbus of the National Institute of Environmental Health Sciences asked about health metrics on a macroscale. "As we think about the health metrics for the real estate industry at the building scale, is there a way to think about how these get aggregated up? Are there metrics connected to the kind of data that are available at the macroscale so that we can incorporate some of these ideas into very large scale economic development projects?"

Trowbridge responded that this will certainly be important. One approach would be to work with an open data platform where the information on various health-related issues is collected in a rawer form. By working with raw data and processing them only as needed, it might be easier to collect and analyze data on a more macroscale.

Al McGartland from EPA asked if behavioral health scientists are working with architects and health scientists to find designs that will encourage people to act in more healthful ways, such as taking stairs rather than an elevator or escalator.

Trowbridge replied that, yes, people from a variety of areas are working with designers to come up with ways to encourage desired behaviors. He mentioned one workshop at the National Institutes of Health where he was able to include interior designers and graphic designers. "That was actually one of my most proud moments," he said. By thinking carefully about things like interiors or signs, it should be possible to nudge people toward more healthful behavior.

"That was actually one of the main points of the NIH [National Institutes of Health] workshop," he said. "We chose a school and we basically said, 'You are going to have to start thinking at multiple scales at the same moment. Everything from the graphic design of the signage up to site selection for that school is going to be relevant going forward.'"

HEALTH EQUITY IN COMMUNITY DESIGN

The next panelist was Nicholas Freudenberg, a professor of public health at Hunter College of the City University of New York. He discussed ways to take health equity into account when undertaking various community development initiatives. He structured his comments around three questions.

First, he asked, what can be done to make sure that community development initiatives designed to improve health contribute to shrinking rather than widening the existing inequalities in health? "I know that is something that all of us who are working in this area worry about," he said. Community amenities like parks, better housing, health food stores, improved transportation, and improved schools are known to contribute to increased property values, he said, but "how do we ensure that these increases in property values and amenities don't push poor people out because they can no longer afford them? Or . . . how can we ensure that these improvements don't create apartheid food, housing, and other kinds of markets with one system—Whole Foods [and] the farmers' markets—serving the better off and the other—the bodegas and convenience stores—serving poor people, creating very different opportunities for health?"

One solution, Freudenberg suggested, lies in the process used to plan community initiatives. "By making sure that all sectors of communities—including those who are sometimes disenfranchised—are involved in planning and making decisions, we can at least maximize the chances that the improvements will benefit everybody and not just the better off," he said.

A second approach is to develop interventions that focus on the poorest and most vulnerable sectors, an approach that is referred to as "privileging the poor" by people who study liberation theology.[7] "For example," Freudenberg said, "in East Harlem, epidemiological studies have shown that the population that has gained the least from the improvements in longevity and health in New York City are middle-aged adults living in New York City Housing Authority facilities." Thus, a lot of the current equity-promoting efforts, both those that the faculty at the School of Public Health are involved in and those that the administration of Mayor Bill de Blasio are carrying out, are focused on populations such as those middle-aged residents of the Housing Authority facilities.

The third approach to ensuring that benefits do not accrue only to the wealthy or the better off is to provide subsidies, Freudenberg said. As an example, he mentioned a program in New York City that supplements the food stamps from the Supplemental Nutrition Assistance Program (SNAP) to help poor people get more fruits and vegetables. A number of other cities have tried such programs as well, he said. "If you are able to

[7] Liberation theology refers to an interpretation of Christian scripture that emphasizes Christ's role as a liberator and one who was especially focused on raising up the voice of the poor and speaking on their behalf.

bring a farmers' market into a low-income community and the prices are somewhat higher, by providing some kind of subsidy, you can make it available to more sectors of the population," he said. "Similarly, setting aside subsidized housing within new housing developments is a strategy that has been used to mix the benefits."

The second question Freudenberg asked was what role health professionals can play in finding an appropriate balance between the market forces in the public sector and efforts to improving community environments to promote health. "Many of the housing, food, health care, and employment problems that low-income communities face result from market failures and the inability of the market to provide all sectors with access to healthy goods. . . services, and products," he said. "For example, the ubiquity of unhealthy food in poor neighborhoods is a market failure of our food system."

The classic solution for market failures—such as information asymmetries, externalities, and various inefficiencies—is government intervention, he noted. "In several sectors, such as food, housing, transportation, and education, the public sector and the market sector coexist, sometimes in partnership and sometimes in competition," he said. But city governments and community development projects have rarely attempted to leverage the public sector to correct market failures.

"I have been thinking about this a lot in terms of food," he said. "There is a very robust public sector in food. . . . New York City serves 260 million meals a year in schools, hospitals, jails, and day care centers. That has the power to change food environments, particularly for vulnerable populations. And food benefits like SNAP and WIC [the Women, Infants, and Children Supplemental Nutrition Program] are an important part of the food retail environment. If we could encourage cities to think about the variety of tools they have in the public sector—all of the different ways that taxpayer dollars and city services touch food or, in other cases, touch transportation and touch housing—and then to use that public sector in a focused way to promote community development and to reduce inequalities in health, I think we might be able to achieve more systematic results than [those from] the kind of laissez faire approach . . . that we see today."

The third question that Freundenberg asked was how people can better integrate job creation, workforce development, and job training into community development initiatives. "The most urgent need for low-income communities is jobs," he said, "especially jobs that have low entry barriers but that also provide a path into lasting jobs that pay a

living wage, offer better benefits, and provide safe working conditions." Finding jobs that satisfy both criteria—low entry barriers and a path into lasting good jobs—is a tall order, he said, because those two things are often in conflict with each other.

"I think it may be possible to develop interventions that meet this need of job creation, or 'upskilling,' while also creating healthier communities," he said. "The Affordable Care Act and the development of patient navigators, . . . chronic disease managers, and community health workers may offer a way to create new jobs within poor communities that also have other benefits to the community, like improving health," he said.

Another area in which such jobs might appear is green industry, he said. "I think the whole green jobs sector—and, particularly, brown field remediation, which led to asbestos abatement—creates entry-level jobs, which if done properly, can lead people into a sector where permanent jobs that are better paying are available."

Yet another possibility is what Freudenberg termed "good food jobs." He said that "the food sector is particularly promising for offering entry-level jobs but not very good at providing living wages or good working conditions. By thinking about jobs that could increase the pay and working conditions and also contribute to making healthier food available, we offer the possibility of improving health. For example, I am working with some folks in the city health department at creating certificates for home health care workers in nutrition, . . . shopping, and food preparation that would, ideally, enable them to make more money but also to contribute to community health."

Discussion

Jack Spengler of Harvard University noted that while the WIC program, with an annual budget of about $8 billion, specifies exactly which foods are reimbursable, SNAP, which supplies about $80 billion in food stamps each year, has no such limitations. With that in mind, he asked Freudenberg, "Can you elaborate more on your public influence in the marketplace that might drive populations to better choices?"

"I think that rethinking how those billions of dollars that SNAP spends, much of which now goes into unhealthy food and subsidizes Pepsi, . . . Coke, and other unhealthy food makers, is a really important opportunity," Freudenberg replied. "We are doing a little bit of work here in East Harlem, looking at stores that already accept SNAP—there

are a lot that do—and that offer healthy, affordable food. We are calling those places food oases within the food swamp of unhealthy food or the food desert of no healthy food." Freudenberg indicated that his group is developing community-driven marketing campaigns to encourage people—particularly those who live in public housing, where diet-related diseases are a particular problem—to patronize these food oases to help these businesses grow and to increase demand for the sorts of food that they provide.

That is one approach, he said. A second is to provide incentives to SNAP recipients to use their vouchers for healthy food so that, for example, $5 of SNAP vouchers would be worth $10 if applied only to healthy food. "I am reluctant to limit SNAP to healthy food," he said, "because that restricts things for poor people in a way that isn't restricted for others. There has been a lot of debate about that. It really divides people. I am looking for incentives for people [who participate in] SNAP to use it for healthier food."

Spengler responded by describing what he had seen on a visit to Malmö, Sweden. "Throughout their public housing, on the sides of their buildings there must have been two-story-high pictures of people in the community—very ethnically diverse in this community—with the food of their native cultures. They created a cookbook and then created restaurants right within the complexes where they lived. They celebrated their ethnic diversity through their common culture of food. It was really well done. It might be an idea that you can think about."

Freudenberg replied that some Brazilian cities have subsidized restaurants that offer healthy food at a steep discount. These restaurants also serve as an economic development project for local farmers because they give the farmers a guaranteed market. "These quasipublic restaurants buy from local producers and then sell at a discount," he said.

Changing the subject, Balbus referred to Freudenberg's suggestion of hiring community health workers as a way of providing accessible jobs with an upside. "Is the Affordable Care Act or anything else," he asked, "providing enough of a market incentive to pay, . . . train, and have community health workers in these communities so that it is a sustainable field?"

A lot of people who work in the health care sector are talking about this, Freudenberg replied. Provisions of the Affordable Care Act and Medicare provide reimbursement for patient navigators at a decent salary. These patient navigators mostly enroll people in health care, but actions are being taken at the state level to certify community health workers and

make their work eligible for different kinds of reimbursement from insurance companies. With the development of health homes, he said, "I think there is a possibility that community health workers could take on some new roles not only in chronic disease management . . . but also [in] chronic disease prevention. That would be a huge potential cost saver. I think there is more evidence that needs to be accumulated to document the potential benefits of that and then to translate that into demonstration projects and then policy."

In response, Goldman said that in Washington, DC, people at George Washington University have a large Center for Medicare & Medicaid Innovation project—more than $20 million, actually—to create a kind of community-based health home for people with HIV/AIDS. "It remains to be seen if these things work. It is pretty exciting that they are at least trying to innovate," she said.

Goldman also said that people involved with a number of funded projects around the country are looking at these sorts of issues, but a certain amount of variability exists from state to state. "Some states aren't actually establishing exchanges, nor are they expanding state Medicaid; therefore, they would not have the need to hire people in some of these roles," she said.

Freudenberg suggested that what is most possible at this point is to carry out demonstration projects "that raise the question of going to scale, not nationally, but within a region." Over the next 5 to 8 years, by gathering evidence about whether it is possible to take these projects to a larger scale and determine what cost savings might be available, that evidence could be used over a longer time period to contribute to better policies.

IMPROVING COMMUNITY HEALTH

In the day's final presentation, Hazel Edwards of The Catholic University of America discussed five broad issues that are key to improving community health in the context of urban revitalization.

She began with a definition of health from the World Health Organization: "Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity." Health, Edwards said, is not just a personal issue; it affects the entire community. Furthermore, with the health care costs and burdens that the individual places on the system, "those places where people live are where we should be fostering well-being."

So what should be done to foster health? One important issue is mobility, she said. "We know the impact that the 1949 Housing Act and federal funding had on our cities, in terms of cutting through and dividing our communities because of the federal funding for slum clearance," Edwards said, showing an image of a city cut through with a number of multilane highways. "How do we, as planners and architects, stitch those neighborhoods back together so that we can connect people with the places that they go to and enjoy?"

Part of the answer lies in the saying "When we make places for cars, we get places for cars; when we make places for people, we get people who are engaged and active in our community." Edwards showed before-and-after images of a city street, the first of which was dominated by roads and parking lots, in other words, an area designed for cars. The second showed a cityscape with something for everyone: roads as well as widened sidewalks for pedestrians, bike lanes, a lane devoted to a streetcar, and plenty of trees to provide shade and beauty. "Places like these address the multiple modes of travel and address the varied mobility needs that are necessary," she said.

Edwards mentioned in particular the Capital BikeShare program in Washington, DC. "It is one of the programs in our region that is helping people to become more active [and] get out of their cars. . . . It connects these dead zones between Metro stations or places where people are going." Other metropolitan areas have similar programs, she noted, including many of the jurisdictions surrounding Washington, for example, such as Arlington and Alexandria in Virginia and Rockville and College Park in Maryland, plus other cities around the country.

"We can't have BikeShare or more cyclists on the road without developing infrastructure that supports them and keeps them safe," Edwards continued. Bike lanes, for instance, protect cyclists from automobiles and also from pedestrians.

"We should look at other places, like Bogotá, Colombia, to see what they are doing," she said. She spoke of Enrique Peñalosa, a former mayor of Bogotá, who focused on making the city convenient to move around in for everyone and not just those wealthy enough to own cars. Showing a photograph from Bogotá with streets, sidewalks, and bike lanes, she explained, "The promenade connects neighborhoods, particularly low-income neighborhoods, to goods and services. During [Peñalosa's] tenure, he transformed the city's landscape and democratized public spaces in Bogotá. He added hundreds of miles of sidewalks, . . . bike paths, and greenways as well as parks."

Sometimes, she said, improving mobility is as simple as making sidewalks safe for pedestrians by adding a setback from the street and pedestrian-scale lighting and planting strips with trees, leaving enough distance from the road that people feel safe and protected from the passing automobiles.

A second key issue in improving community health is land use. Much of the 20th century was devoted to development that separated land uses, with large numbers of people moving outside of cities into suburbs, Edwards noted, but in recent decades there has been a return to the city and more mixed-use and transit-oriented development, along with the desire to create destinations so that people will have places to walk to. "Walkability is great," Edwards said, "but you need a place to walk to and places [people] can access within a quarter mile." Showing a photo of a vibrant neighborhood in the Columbia Heights section of Washington, DC, she said that one of the keys to the development of that neighborhood was the opening of a Target store and other major retailers.

"Harriet Tregoning, the former director of the D.C. Office of Planning who now is at HUD [the U.S. Department of Housing and Urban Development], used to talk about how people didn't think that Target would work here in the city or work in an urban setting," Edwards said. "She said, 'I have actually seen people carrying 50-inch flat-screen TVs from the store.' As I drive around . . . I have seen Target bags a mile or two miles away. There has been a great need for this type of retail in the city."

A photo from downtown Silver Spring, Maryland, showed an open space, or plaza, that is a playground for children but also a place where merchants are set up. "It is a flea market, a farmer's market, but a great space for the neighborhood," Edwards said. She then showed a photo from South Orange, New Jersey, of a traditional train station to which a number of shops that cater to people that are commuting were added. "As you are going to catch the train to go into Manhattan, for instance, you can stop and get coffee or drop your clothes off at the cleaners," she said. "These transformed a single-use development into a multiuse development that caters to the needs of the community." All of these examples underscore the importance of land use to creating healthful spaces for communities.

The third issue that Edwards described was food access. In many places across the country, particularly in the South, significant numbers of people have no car and no supermarket within a mile of where they live. In many cases where people—particularly minorities and low- and

even moderate-income people—do have access to food, the food choices that they have are not healthy ones; for example, they are fast-food or convenience stores with few fresh foods.

One way to improve food access is to set up community gardens and urban agriculture. This has benefits beyond the provision of healthy foods, Edwards said. "In addition to the quality produce, it is a way to get children engaged. It is a way to keep them from the ills of the city, having them right there, working with their parents or relatives. It is also a way to engage the older population." She mentioned a documentary that described how a church in New York City had begun growing plants on a vacant parcel of land. "It was a teaching garden, but it was also a place where the older members of the church came together on certain days and they shared the stories of the community. These can become these great centers of the neighborhood." Farmers' markets provide a similar service, making healthy foods available but also engaging the community, she said.

Some negatives may also be associated with improved food choices, she said. In particular, as better, healthier foods become available in an area, it can be a trigger for gentrification, and the lower-income people who had been in the area may not be the ultimate beneficiaries of the new stores.

The fourth issue that Edwards offered was affordable housing. Affordable housing refers not only to affordability for residents but also to affordability for businesses, Edwards said, because as prices increase for residents, they also increase for businesses. "Affordable housing relates to a stable home environment for residents and access to quality schools," she said. "It also means a decrease in transportation costs and burdens on low- and moderate-income families because they can live in town, as opposed to living farther out in areas that they can afford. It also means more investment in quality schools."

The final issue she described was community engagement. Referring to the earlier presentation by Dan Kinkead of the Detroit Future City Implementation Office, Edwards noted that he had spoken about the importance of not taking a top-down approach in urban revitalization efforts. "It really needs to engage people—hopefully, a cross-section of the community in terms of age, ethnicity and race, gender, and class. You really need to work through as many of the organizations that exist."

She also mentioned the Sustainable DC program, saying that it had been very good about setting up a community engagement process that brought a cross section of the city together. "There were the big meetings

with hundreds of people, down to the very small groups," she said. "All of this was geared toward listening and getting people's inputs and comments. It is these pieces of paper, these points of information that I think are critical. The community, they live there. We are the experts. We are the ones who bring the knowledge that will help to kind of synthesize their points of view, but listening to the residents—and not just the residents but all of the community stakeholders—is very important."

There are a variety of keys to effective community engagement, Edwards said. Residents and community members should be brought to the table early and often. There should be open dialogue with the various city agencies that affect quality of life and livability issues, such as planning, transportation, economic development, housing, and health and human services. Monitoring and mitigation tools should be developed for residential, business, and commercial properties to gauge the changes that occur. Social, economic, and physical conditions should be addressed together in a holistic way. Finally, she said, the aim should be for outcomes that promote a just and equitable society.

"I will close with this quote," Edwards said. "Communities and neighborhoods that ensure access to basic goods, that are socially cohesive, that are designed to promote good physical and psychological well-being, and that are protective of the natural environment are essential for health equity" (Marmot et al., 2008). It is vital, she said, that people from the architecture and planning communities reach out to the public health professionals and do a better job or work together to create healthy communities.

Discussion

Canice Nolan of the European Commission began the discussion period by noting that he had heard very little at the workshop about federal efforts to encourage urban regeneration. Goldman responded that HUD does have such a program. It is run by Harriet Tregoning, who had been invited to the workshop but was not able to attend. The hope is that she will be able to attend a later Roundtable meeting.

In Europe, such encouragement of urban revitalization is not seen as the European Commission's responsibility, Nolan said. Instead, it is the member states and cities themselves that are seen to be responsible. Also, the World Health Organization runs a network of healthy cities in Europe, noting that he had not heard anything at the workshop indicating

that people in the United States are trying to create a healthy-living network that spanned a number of cities.[8]

"From our research side," he said, "we can incentivize and try to stimulate the market. We, in fact, are proposing prizes for tools for smarter cities." The European Commission is also involved in establishing networks of city procurement officers and developing common standards "so that people are not always reinventing the wheel or repeating old mistakes."

Another speaker asked about the approaching reauthorization of the transportation bill and what is likely to happen with investments in nonmotorized transportation. Goldman responded that the major issue is cost. "I don't think it is a partisan issue, in terms of investing in alternative transportation," she said. "I do think it is a very important issue to bring to the attention of Congress. That act does have an enormous amount of leverage."

Concerning the transportation bill, she suggested that instead of focusing on specific solutions, such as building sidewalks, it would be more useful to get policy makers to focus on outcomes such as walkability. "I think there has been a tendency with that kind of bill to focus on the product instead of the outcome," she said, "and perhaps we health people need to get more involved with transportation policy than we have been."

REFERENCES

HHS (U.S. Department of Health and Human Services). 2015. *Step it up! The Surgeon General's call to action to promote walking and walkable communities*. Washington, DC: U.S. Department of Health and Human Services, Office of the Surgeon General.

Kramer, A., T. Lassar, M. Federman, and S. Hammerschmidt. 2014. *Building for wellness: The business case*. Washington, DC: Urban Land Institute.

Lee, K. K. 2011. *Active design guidelines: Promoting physical activity and health in design*. New York: New York City Active Design Guidelines Team.

[8] Although it was not discussed at the workshop, the interested reader can access information about Advancing the Movement in the United States at http://advancingthemovement.org (accessed October 6, 2015).

Marmot, M, S. Friel, R. Bell, T. Houweling, and S. Taylor, on behalf of the Commission on Social Determinants of Health. 2008. Closing the gap in a generation: Health equity through action on the social determinants of health. *Lancet* (372):1662–1669.

Speck, J. 2012. *Walkable city: How downtown can save America, one step at a time*. New York: Farrar, Straus and Giroux.

Urban Land Institute. 2015. Building healthy places toolkit: Strategies for enhancing health in the built environment. Available at http://uli.org/wpcontent/uploads/ULI-Documents/Building-Healthy-Places-Toolkit.pdf (accessed September 16, 2015).

6

Closing Remarks

In the workshop's final session, Roundtable chair Frank Loy offered some closing comments. He said that he was not attempting to summarize the workshop but, rather, was sharing thoughts on some of the issues that stood out to him the most.

To begin with, he said, it is important to keep in mind that the assurance of health involves more than simply the provision of medical services. One must take into account the environments in which people live as well as equity and sustainability. In that sense, he said that he thought that the workshop had offered a very rich and useful discussion because it was focused on an aspect of health and medicine—the role of the built environment, in particular—that is often not at the forefront.

Loy reiterated a point made by Gregory Kats in his presentation: that it is generally possible to make progress on health only by involving two other constituencies, private enterprise and the community. Health care professionals operating on their own will not be nearly as successful as those who collaborate with these two other groups, he said.

The most effective way to get the private sector involved is to demonstrate that it is profitable, Loy said, and the return-on-investment demonstration that Kats offered was a very powerful approach to that. Just like anything else, health needs to be sold, he said, and the health community must understand that and embrace it.

"In the case of the community," he continued, "what I was reminded of today is that issues such as an equitable society, a decent quality of life for all, and a respect for human dignity are not just the maraschino cherry on top of the ice cream. They are central to getting what we want done in the area of health." This should not be surprising, he added, because dignity is a huge part of what makes human beings tick. "A desire for fairness is built into every one of us. Some of us come out a little better on the fairness side of life than others. It is not surprising that the absence of fairness is a handicap to health care professionals who try

to improve the health of the various societies that sometimes are quite suspicious."

Next Loy mentioned the idea, described by Kimberlydawn Wisdom, of using a hospital or other health care facilities for community activities that have nothing to do with health. In particular, he pointed to hospitals serving good food and making it available to the broader community. It seems like a very effective way of integrating an institution into the community, he said. He also appreciated the idea of a hospital providing a place where people can congregate for such activities as playing cards and said that it should make the institution seem less formidable and more friendly.

In the discussion of the Rebuild by Design competition for coming up with ways to rebuild the New York area after Hurricane Sandy, Loy said he was struck by the idea of using foundation money to enable architects, health care professionals, and others to organize themselves so that they can maximize the use of the government funds that are made available in a situation like this. It seems like a good way to "divide the labor" among the various funding agencies, he said.

One comment from the discussion on food that was particularly striking, Loy said, was that some people view the arrival of the Safeway in an underserved area as a worrisome first step toward gentrification. "It seems to me that, having griped about the absence of food opportunities and food choices in the poorest section of our city, the arrival of a Safeway . . . ought to be celebrated and not feared," he said. "Somehow or other, we have to deal with the proposition that when you provide options, . . . some families are going to move into that neighborhood . . . because they have a grocery store. I can't believe that is bad. I just didn't quite get that part."

A second food-related discussion that Loy found interesting was the difference of opinion concerning whether the rules concerning the food stamp program should be changed to encourage the purchase of healthier foods. How one views that question will likely depend on how one feels about the rights of the individual versus the regulatory reach of the government. This is an issue that deserves additional discussion, he said, and, he hoped, it is something that the Roundtable will be able to return to in the future.

A

Workshop Agenda

November 10, 2014
Lecture Room
National Academy of Sciences Building
2100 Constitution Avenue, NW
Washington, DC

Objectives:	Discuss how three major American cities faced with the opportunity for major revitalization brought considerations of public health into rebuilding and reimaging the urban environment.
9:00 am	**Welcome** **Frank Loy, LL.B.** Roundtable Chair
	Workshop Overview: A Tale of Three Cities **Lynn Goldman, M.D., M.P.H.** Roundtable Vice-Chair Dean, Milken Institute School of Public Health George Washington University
9:30 am	**Session 1: Washington DC**
Objectives:	Discuss utilizing green technologies to increase the livability and sustainability of Washington, DC. Describe how to ensure that health is included in these frameworks and that these technologies reach the general population, especially the most vulnerable groups. Explore the use of metrics to evaluate programs.

Speakers:	**Gregory Kats, M.B.A., M.P.A.** President Capital E
	Brendan Shane, J.D., M.S. Chief of the Office of Policy and Sustainability Department of Environmental Health Government of the District of Columbia
	Discussion
11:00 am	**Session 2: Detroit**
Objectives:	Discuss the Detroit Future City framework. Describe how to focus rebuilding efforts in Detroit to ensure that health is considered in all policies and health equity, including the role of public health departments and health systems.
Speakers:	**Dan Kinkead, M.A.U.D.** Director of Projects Detroit Future City Implementation Office
	Loretta Davis, M.S.A. President and Chief Executive Officer Institute for Population Health
	Kimberlydawn Wisdom, M.D., M.S. Senior Vice President of Community Health and Equity Chief Wellness Officer Henry Ford Health System
	Discussion
12:30 pm	**Lunch Break**

2:00 pm	**Session 3: Rebuild by Design: New York and Environs**
Objectives:	Discuss a novel process, a competition, to foster approaches to transform, rather than rebuild, communities affected by Hurricane Sandy.
	Nupur Chaudhury, M.P.H., M.U.P. Senior Project Manager, Rebuild by Design PennDesign/OLIN

3:15 pm	**Session 4: Cross-cutting Issues**
Objectives:	Reflect on the previous panels and discuss cross-cutting issues that face all urban environments, especially ensuring equity for residents of neighborhoods undergoing gentrification and ensuring that all aspects of a livable, heathy city are encouraged.
Speakers:	**Matthew Trowbridge, M.D., M.P.H.** Senior Research Fellow, U.S. Green Building Council Associate Professor, Department of Emergency Medicine Department of Public Health Sciences University of Virginia School of Medicine
	Hazel Edwards, Ph.D., AICP, Assoc. AIA Associate Professor Director, Master of City and Regional Planning Program School of Architecture and Planning The Catholic University of America
	Discussion

4:30 pm	**Session 5: Summary and Closing Remarks**
Speaker:	**Frank Loy, L.L.B., Roundtable Chair**
4:45 pm	**Adjourn**

B

Speaker and Moderator Biographical Sketches

Nupur Chaudhury, M.P.H., M.U.P., is a senior project manager with Rebuild by Design in Brooklyn, New York. She has worked at the nexus of urban planning and public health with projects in Ecuador, India, and the United States and through organizations such as the Clinton Foundation, UNICEF, United Nations-Habitat, the InterAmerican Development Bank, and New York City's Department of City Planning. Previously at the Brownsville Partnership (an initiative of Rosanne Haggerty's Community Solutions), Ms. Chaudhury designed and managed the entirety of the organization's health programs in Brownsville, Brooklyn. She deliberately focused on acting as a bridge between city agencies and professionals in both the urban planning and public health fields to facilitate changes to the neighborhood's urban form to improve health outcomes in Brownsville. She received a bachelor's degree in the growth and structure of cities from Bryn Mawr College, a master's degree in urban planning at New York University's Robert F. Wagner School of Public Service, and a master's in public health degree at Columbia University's Mailman School of Public Health.

Loretta V. Davis, M.S.A., has management experience that spans 25 years, two sectors, a myriad of key public health issues, and a full range of administrative and operational functions, including fiscal management, contract negotiations, policy and procedure development, personnel management, and program design and development. As the president and chief executive officer (CEO) of the Institute for Population Health, Ms. Davis joins the ranks of only four other city-level public health institute CEOs across the United States. In this position she champions the agency's mission to advance positive health conditions in populations and communities. In addition to leading the formation of the Institute for Population Health, she has led the financial repair of five clinics across southeast Michigan, bringing them from deficit spending to viability; mobilized a county's response to the H1N1 influenza virus pandemic; served as a principal partner in creating and implementing Michigan's

early response to HIV/AIDS; and partnered in crafting the HIV/AIDS response in Ethiopia, East Africa. She received a bachelor's degree from the University of Michigan and a master of science in health service administration from Central Michigan University.

Hazel Edwards, Ph.D., AICP, Assoc. AIA, has had a unique 27-year career that combines place-related research with planning and urban design practice. Her research interests in quality of life are framed within urban design contexts, while they are focused primarily on residential and campus environments. Her design background has served as a foundation for her talent for translating and representing ideas and concepts as well as creating alternatives. This orientation has had a strong influence in all of her work, from campus planning (in which she led a number of comprehensive university planning and development activities) to master planning activities (for a community college in South Africa and residential environments), urban transportation studies, qualitative and quantitative analyses, predevelopment services (such as feasibility analyses, site access, and circulation review), building-related projects, community engagement, and proposal writing. Dr. Edwards earned degrees from Howard University (bachelor of architecture), Harvard University (master of architecture in urban design), and the University of Illinois at Urbana-Champaign (doctorate in regional planning). She also completed postdoctoral work in regional planning at the University of North Carolina at Chapel Hill. She has taught at the School of Architecture and Planning at The Catholic University of America in Washington, DC, since 2007 and heads its Master of City and Regional Planning program.

Lynn R. Goldman, M.D., M.S., M.P.H., is a world-renowned epidemiologist, pediatrician, educator, and former regulator at the U.S. Environmental Protection Agency (EPA). Dr. Goldman was named dean of the George Washington University School of Public Health and Health Services, as it was known then, in 2010. In 2014, she assumed the role as Michael and Lori Milken Dean of Public Health at the newly renamed Milken Institute School of Public Health at George Washington University. Her areas of focus are public health practice, children's environmental health, disaster preparedness, and chemical and pesticide regulatory policy. As assistant administrator for toxic substances at EPA, she directed the Office of Prevention, Pesticides and Toxic Substances from 1993 through 1998. Prior to joining EPA, Dr. Goldman served as

chief of the Division of Environmental and Occupational Disease Control of the California Department of Health Services. Dr. Goldman has served on numerous boards and expert committees, including the Committee on Environmental Health of the American Academy of Pediatrics and the Centers for Disease Control and Prevention Lead Poisoning Prevention Advisory Committee. Dr. Goldman is a member of the National Academy of Medicine, vice chair of the National Academies of Sciences, Engineering, and Medicine Roundtable on Environmental Health Sciences, Research, and Medicine, and a member of the Academies' Standing Committee on Risk Analysis Issues and Reviews.

Gregory Kats, M.B.A., M.P.A., is president of Capital E, a national clean energy advisory and venture capital firm. He previously served as managing director of the investment firm Good Energies. Prior to that he was director of financing for the Office of Energy Efficiency and Renewable Energy at the U.S. Department of Energy, where he led national programs to develop and deploy renewable energy, energy efficiency, and advanced building technologies. Mr. Kats was the founding chair of the International Performance Measurement and Verification Protocol. He is a founder of the American Council on Renewable Energy and is a founder of the country's first green bank, New Resource Bank. He was the principal adviser in developing Green Communities, now the national Green Affordable Housing design standard. Mr. Kats is a member of the Leadership in Energy and Environmental Design (LEED) Steering Committee and serves as chair of the Energy and Atmosphere Technical Advisory Group for LEED. He earned an M.B.A. from Stanford University and, concurrently, an M.P.A. from Princeton University on a Woodrow Wilson Fellowship.

Dan Kinkead, M.A.U.D., serves as director of projects for the Detroit Future City (DFC) Implementation Office. In this role, he provides leadership, strategic coordination, and technical expertise for the many projects that are led or supported by the DFC Implementation Office. Mr. Kinkead has worked with the DFC Implementation Office since its inception, wherein he led the initial process to build the implementation team, secure operational funding, develop the organization's steering committee, and spearhead its first set of projects and initiatives. Prior to joining the DFC Implementation Office, he was a design principal with Hamilton Anderson Associates (HAA), where he led the design studio for architecture and urban design and managed land use and neighborhoods

research and planning for DFC. This included leading the team that assembled the 350-page DFC Strategic Framework report that serves as the platform for transformation in Detroit. Prior to working with HAA, he was an urban designer with Skidmore Owings & Merrill, LLP, in New York City, where he worked on large-scale innovation district designs for continental Europe and China. Mr. Kinkead graduated from Harvard University with a master of architecture degree in urban design and earned a bachelor's degree in architecture from the University of Kentucky. He is a registered architect, and his work has been published in a range of national and international media, including *Architect*, *The Plan*, and *Architectural Record*.

Brendan Shane, J.D., M.S., is the director of the Office of Policy and Sustainability at the District of Columbia Department of the Environment. He is responsible for developing policy and programs in waste management, renewable and clean energy, climate, and green building. He is a principal staffer for the mayor's Sustainable DC initiative, working across the District Government and with community stakeholders to define and implement the mayor's vision of making the District the greenest city in the nation. A watershed hydrologist and attorney by training, he was director of Environmental Policy and Programs with the Anacostia Waterfront Corporation, and prior to that he was an associate attorney with Van Ness Feldman, P.C. He received a law degree from Georgetown University and an M.S. in geology from the University of Maryland, College Park.

Matthew Trowbridge, M.D., M.P.H., is an associate professor at the University of Virginia School of Medicine with a special interest in the impact of the built environment on public health. He studies how health-promoting educational design strategies can support active communities and reduce incidence rates of childhood obesity. Dr. Trowbridge is a 2013–2014 Mark Ginsberg Sustainability Fellow of the U.S. Green Building Council and received resources to further advance the understanding of how sustainable buildings, neighborhoods, communities, and cities can lead to healthier, more productive lives for everyone. He is interested in providing more opportunities for public health researchers to engage directly with design firms and communities to keep learning how to target health promotion priorities and improve access to healthy environments. He received an M.D. from the Emory University School of

Medicine and an M.P.H. from the Rollins School of Public Health at Emory University.

Kimberlydawn Wisdom, M.D., M.S., is a board-certified emergency medicine physician who practiced for 20 years at the Henry Ford Health System (HFHS) in Detroit, Michigan. She also founded and directed both the Institute of Multicultural Health at HFHS and a National Minority Quality Forum award-winning community-based health screening initiative entitled AIMHI (African American Initiative for Male Health Improvement), which focused on improving the health of those disproportionately affected by poor health outcomes. She is an assistant professor of medical education at the University of Michigan (UM) Medical Center and serves as adjunct assistant professor in the Department of Health Behavior and Health Education at the UM School of Public Health. In February 2003, Dr. Wisdom was appointed by Governor Jennifer M. Granholm to be Michigan's—and the nation's—first state-level surgeon general to address Michigan's less than desirable health status. She has focused on physical inactivity, unhealthy eating habits, childhood lead poisoning, tobacco use, chronic disease, infant mortality, unintended pregnancy, and health disparities, among other areas of concern. In April 2007, Dr. Wisdom returned to HFHS as vice president of community health education and wellness while retaining her post as surgeon general. In March 2011, Dr. Wisdom was promoted to senior vice president of community health and equity and chief wellness officer. She continues to develop and lead efforts that improve the health of the community and address health care equity and health disparities. She is the recipient of numerous awards, has authored several peer-reviewed publications, and appeared on national television, including ABC's *Nightline*, and has made presentations to audiences across the United States and internationally.

.