BUILDING AMERICAN PUBLIC HEALTH

URBAN PLANNING, ARCHITECTURE, AND THE QUEST FOR BETTER HEALTH IN THE UNITED STATES

RUSSELL LOPEZ

Building American Public Health

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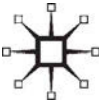

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To my brother, Steven Lopez

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Preface

I was one of those little kids who always had to look at everything. As I walked or was driven around, I had to know how things got to be the way they were and I must have tested the patience of my parents with my constantly asking, Why does such and such a place look the way it does? As an adult teaching and researching the built environment, it became clear that the buildings and neighborhoods around us reflect a history and a set of sometimes lost ideas, concerns, and assumptions. When I walk to work or run errands, I pass brutalist concrete buildings, stately row houses, New Urbanist mixed housing, and old-style public housing developments. In the course of the rhythm of the year, I might visit modest postwar suburbs and opulent late twentieth-century postsuburbia shopping malls and corner stores. Again, it is clear that each of these reflects a thoughtful set of values and ideologies, now perhaps unknown to passersby. So this book began as research into the varied ways Americans have sought to construct the environment around them and the implications these may have for health and the environment. It evolved into a homage to the many men and women who strove to improve the lives and health of humanity. May their important efforts not be forgotten. My hope is that others, young and old, may someday gaze upon buildings and neighborhoods that reflect these peoples' work and think, Wow! So that's why it looks like that.

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Acknowledgments

Writing this book was generally a joy, punctuated by occasional bouts of frustration. That the book was completed is the result of the good wishes and support of many. Among my former colleagues at Boston University, I must thank H. Patricia Hynes, David Ozonoff, Leslie Boden, Lew Pepper, and Richard Clapp for encouraging me to take up a career of research and writing. In addition, I owe a great deal of thanks to Greg Howard, who cotaught the course on the Built Environment that served as a launching point for this book. My colleagues at Northeastern University, especially Barry Bluestone, Stephanie Pollack, and Shan Mohammed, were helpful, providing me space, time, and encouragement as I sought to complete this book. The students in the Built Environment course were also great in asking many probing questions that had to be answered in this book. I also am grateful to Chris Chappell, Sarah Whalen, and the rest of the staff at Palgrave Macmillan for their work to make this book publishable.

Even in an age when many materials are online, much of this research took place in libraries. The staff of the Boston University Medical Library cheerfully hunted down obscure texts that have yet to be digitized. I am also grateful to the research librarians at the Museum of Modern Art Library and the Burnham Library at the Art Institute of Chicago for allowing me access to their materials. A number of people read drafts of the manuscript and I am thankful for their comments and enthusiasm. These include Robert Bruegmann, Audra Wolf, Barbara Goldoftas, and Marc Maxwell. Four others also were most supportive of this project at crucial times when my energy was low: James Jennings, George Galster, Howard Frumkin, and David Dixon. In addition, the staff at Robert Wood Johnson's Active Living Research, including James Sallis and Amanda Wilson, must be thanked for their grant support of some of the research that eventually led to this book. Similarly, Allen Dearry,

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The Library of Congress was the source of many of the illustrations in this book. Parts of this book were included in an article in the *American Journal of Public Health*: Russ Lopez, "Public Health, the APHA, and Urban Renewal," September 2009, Volume 99, Issue 9, pages 1603–1611.

Finally, I wish to thank my family and friends who listened to me research and write this book. Many members of both the Lopez and Sherman families accompanied me to museums and exhibits, waited patiently while I explored buildings and neighborhoods, and listened sympathetically while I wrote this manuscript. In particular, thank you to Bonnie Sherman, Andrew Sherman, and Steven Lopez.

Author Biography

Russell Lopez has a Masters in City and Regional Planning from the Kennedy School of Government at Harvard University and a Doctorate in Environmental Health from the Boston University School of Public Health. With funding from the Active Living Research program of the Robert Wood Johnson Foundation and the National Institute of Environmental Health Science, he has conducted research and published papers on the health impacts of the built environment, racial residential segregation, and income inequality. He co-developed one of the first courses on health and the built environment and has taught at Brown, Tufts, and Boston University. Currently he is Senior Research Associate at the Kitty and Michael Dukakis Center for Urban and Regional Policy at Northeastern University.

CHAPTER 1

INTRODUCTION

TO A GREAT EXTENT, THE DESIGN OF HOUSES, businesses, neighborhoods, and metropolitan areas in the United States reflects efforts to reform the built environment to protect and promote health. Nearly every house has a kitchen and a bathroom, and each room has a window, while street layouts, whether hierarchical with cul-de-sacs, collector streets, and arterials, or based on the grid, document the health priorities of the eras in which they were developed. Some neighborhoods are exclusively residential, while others include stores and offices, depending on whether mixed use was seen to be a problem or a virtue. It is possible to examine a community and decipher its planners' and architects' conceptualization of a healthy environment, much like an archeologist can sift through ruins to understand an ancient culture.

Over the past 150 years, many urban planners and architects, but also social reformers, public health advocates, and others, have attempted to use the design of housing, neighborhoods, cities, and metropolitan areas to promote health. US reformers borrowed extensively from Europe as well as developed their own ideas on how best to meet the challenges posed by urbanization and poor health. Along with the benefits provided by rising incomes and advancing technologies, they succeeded in addressing many problems posed by the built environment. However, consensus on both what constitutes a most healthful environment and health priorities have changed and our understanding of the association between the built environment and health continues to evolve. This book is a survey of the effort to modify the built environment for health. It is timely because the past 15 years have seen a reconnection of public health and urban planning, with the two disciplines energizing and informing the work of each other. As the two go forward in partnership, it is important to consider what they have jointly accomplished in the past.

WHAT SHAPES THE BUILT ENVIRONMENT?

The idea that the built environment has effects on health has been widely accepted for over 150 years. Edwin Chadwick developed a case that the built environment influenced health in his study of housing conditions in England in 1842.[1] He documented that poor housing conditions were associated with sickness and death in urban slums. Since then, few have questioned the existence of a built environment–health connection, rather it is the characteristics of the connection, the magnitude of its effects, and the appropriate role of government in manipulating the environment that are debated. None of the various groups that are described in this book—the sanitarians, settlement house workers, and City Beautiful proponents in the nineteenth century; the tenement law advocates, planning activists, and housers of the first half of the twentieth century; or the Modern architects, suburban housing developers, urban renewal proponents, and New Urbanists of the past 50 years—have denied that there is a link between the built environment and health. Even in today's clashes between those who promote neighborhoods of single-family homes that are dependent on automobiles and those who advocate for density and a return to traditionally designed neighborhoods, advocates on each side of the low density vs. high density debate argues that their very opposing ideal communities best promote health.[2]

Therefore, a critical question must be, what shapes the built environment? As Manuel Castells wrote, "A city (and each type of city) is what a historical society decides the city (and each city) will be."[3] But how do they decide? Some of the factors that influence design lie beyond the scope of this narrative and are mentioned only when they loom large in the discussion. These include economics, climate, geography, and war. Some factors are global in scale: for example, turmoil in Europe in the nineteenth century fostered the emigration of millions of Jewish, Irish, and Italian people to the United States, transforming neighborhoods and cities and creating political responses.[4] Other effects are more local and subtle: the need to import water resulted in Los Angeles having a pattern of development very different from that of greater Atlanta, where plentiful rain allowed larger suburban lots.[5]

Despite the great variety of issues that have dominated debates on urban health over the past 150 years, three elements continually emerge as underlying how building and urban design decisions have evolved: *assumptions, values,* and *ideology.* These factors are consistent with Henri Lefebvre's theory that urban space is socially constructed.[6]

The role of *assumptions* is critical. For more than a century, most city planners, public health advocates, the public, and policy makers assumed that overcrowding and congestion were bad for cities and

health.[7] Therefore, they implemented policies—height restrictions, anti-crowding ordinances, suburban new towns, highway construction, large-lot zoning, superblocks, urban renewal, and other initiatives—to reduce densities and alleviate congestion. It was only after Jane Jacobs published her 1961 book, *The Death and Life of Great American Cities,*[8] in which she argued that the density, congestion, and chaos of overbuilt cities should be celebrated, that a counterbalance to the de-densification movement began to materialize. Drawing on Jacobs' changed assumptions regarding city living and other evolving ideas on desirable urban living, architects and urban planners proposed a wide spectrum of design initiatives: New Urbanism, smart growth, transit-oriented development, mixed-use buildings, and other similar new design forms. Her ideas eventually contributed to US urban renaissance at the end of the twentieth century.[9]

Values are similarly important. Do people prize neighborhoods with houses on large lots set back from streets? Or do they want apartments with diversity and a wide variety of family and household types? Is the personal freedom of the automobile important? Or do we want to conserve energy by using public transportation? Values and personal preferences can guide both individual decision making and public policy initiatives and they can highly influence design initiatives.[10] For example, one movement of architects, the Modernists, adopted the goal of improving humanity through architecture as one of its guiding principles.[11]

Values are closely related to *ideology*. The nineteenth and twentieth centuries have seen a number of important theories regarding the proper role of social policy and government action that have contributed to development decisions. As will be discussed, these have included diverse ideologies such as utilitarianism and neoliberalism. Other theories, including Fordism, post-Fordism, and the idea of a culture of poverty, have also influenced public policy and the design of communities.[12]

There has been a shift in the priorities of those studying and working to use the built environment to address health problems, moving from an emphasis on addressing the infectious diseases in the nineteenth century to a priority focused on mitigating the chronic diseases at the beginning of the twenty-first century.[13] This is an example of Michel Foucault's theory that social discourse can suddenly shift and that science then reorganizes itself along dramatically different paradigms.[14]

Two Disciplines Dedicated to Change: Design and Health

The health and design disciplines have been closely linked in the pursuit of healthier urban environments and it is the intersection of these

two—"public health" and "urban planning"—that is the focus of this book. Urban planning, as used here, also includes the professions of urban design, architecture, and landscape architecture, while public health is meant to encompass the fields of epidemiology, sanitarians, medicine, and nursing. The history set out here demonstrates the benefits resulting from the work of people who believed that improved health was possible and that by changing the status quo, they could solve health problems and relieve the physical suffering of millions. It may not be easy to change how societies think about health, and to even suggest that there is a need to change how they construct their cities may take optimism and vision. But history suggests that many of the design and health professionals engaged in improving cities, living conditions, and the built environment thought they could make the world a better place.[15]

Therefore it is not surprising that the modern fields of public health and urban planning, along with social work, simultaneously began in the nineteenth century in response to conditions in US and European cities.[16] The problems associated with urbanization, industrialization, and immigration, coming at a time when new technologies promised hope that illness, poverty, and moral degradation could be alleviated, created a "roll up our sleeves and get to work" mentality. Hence, these professions developed as rational responses to extreme situations.[17]

While in 1900, public health had been closely involved in addressing the health problems posed by tenement dwellings, contaminated water supplies, and overcrowded slums, by 2000 most people paid scant attention to the connection between housing design, neighborhood form, transportation systems, and morbidity and mortality.[18] A 100 years had brought about a remarkable decoupling of health from place. But more recently, there has been a reconnection of public health with architecture and urban planning. The American Planning Association now includes health professionals and the American Public Health Association has reached out to architects and urban planners. There are now interdisciplinary courses and joint areas of research.[19]

This Book

In 1900 a baby born in the United States had a life expectancy of 47 years, 30 years less than that of a baby born in 2000.[20] Today, some studies define premature death as death before the age of 65.[21] How this change came about and the roles played by urban planning and public health have a long history. But much of this story is unknown; as the architectural historian Sam Bass Warner once wrote, "Americans have no urban history."[22] However, what we see when we walk or drive around

twenty-first-century America are the results of over 150 years of reforms. The built environment that surrounds us today can be characterized, in part, as a series of legacies left by those who identified problems and invented solutions.

This book sets out to document the history of these past efforts so that we might have a better understanding of why the built environment looks the way it does. It highlights the history of the United States, though it often travels abroad to trace the roots of ideas that were born elsewhere. It is not that the experiences of urban development and health in other countries are not important; rather, this book concentrates on the United States because each country's built environment arises from its own unique set of experiences. Perhaps someday it may be possible to construct a global history of the built environment, but that can happen only after we have a better understanding of individual national histories. The focus here is on the built environment: the sum of the human-made buildings, streets, neighborhoods, cities, and metropolitan areas in which we exist. The book is more concerned about urban than rural environments, because a majority of people in the United States live in metropolitan areas and not in the countryside.

We will examine how designers, architects, social reformers, and others have tried to manipulate the built environment to improve health. However, they were not always successful. Each generation is limited by its understanding of diseases, how it prioritized the diseases on which to focus, and the social structure within which it operated. In addition, one generation's solutions to the problems of the built environment sometimes posed challenges to the next.

It is not easy to evaluate efforts to modify the built environment. A major problem in any assessment of a diverse set of historical initiatives is the development of a metric for analyzing them. On the one hand, it is problematic to use current standards to critique past policies. On the other hand, it is also important to have absolute standards because much of what we know today, in moral, political, and health terms, was known in the past. Therefore, to evaluate past and current ideas and programs, this book will use three sets of criteria derived from the environmental sustainability literature: *health, equity,* and *sustainability.*[23]

Health has always been a simultaneously precise and vague construct. As stated by the World Health Organization, health is not merely the absence of disease; it reflects the totality of a person's existence and must be inclusive of physical, mental, and social dimensions.[24] We can evaluate health in absolute terms. What is the mortality rate? How long can people reasonably expect to live? What is the incidence and prevalence of disease? Health statistics enables us to make comparisons over time.

Equity, the distribution of good and poor health, must also be part of any analysis of the built environment. Health risks cluster at the lower end of social strata. Thus, it is vitally important that policies be assessed on how they impact everyone, particularly if these policies result in increased health disparities associated with race, income, or sex.

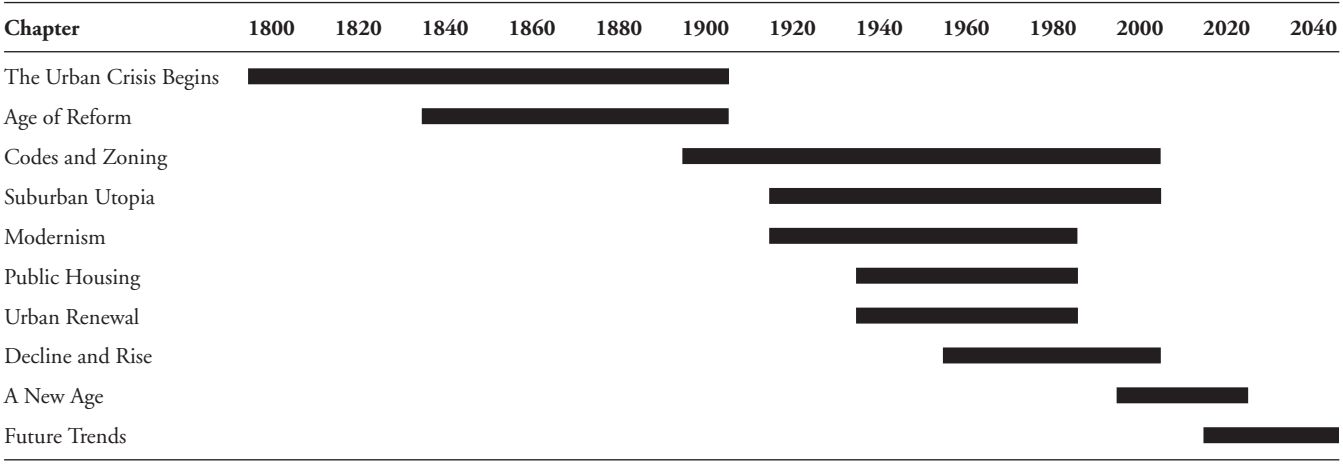
We live in a world that may be poised to finally reach the limits of its resources; therefore, we must evaluate the *sustainability* and environmental impacts of public policies regarding the built environment. Equity and sustainability must be carefully and closely linked, however, for as Peter Marcuse has pointed out, it is very easy to promote sustainable societies that perpetuate existing inequities.[25]

As in any history, this book has to be selective, leaving out many important people and events that may be critical to our overall understanding of the past, but are secondary to the story told here. Thus there are only occasional mentions of the labor movement, which did so much to transform the work environment. Hospital architecture, though fundamental to the care of the sick, is not part of this narrative, nor does the book include the work of geneticists or the developers of vaccines. Furthermore, it doesn't cover the accomplishment of many great architects whose legacy is their buildings, cityscapes, and theories, which still impact today. For those looking for a comprehensive history of urban planning or public health, it is suggested they consult the works of authors such as Peter Hall or George Rosen, respectively.[26] Their work, among that of many others, helped inform this book.

As can be seen by the timeline in table 1.1, this book covers two centuries of urban history. It begins with an overview of the environmental and health conditions of US and Western European cities just before the beginning of the industrial revolution. It then describes the impacts of industrialization, urbanization, and immigration on newly expanding cities. It is followed by a description of the efforts of late nineteenth-century reformers to meet these challenges with a set of limited tools and bold initiatives. There is a chapter on twentieth-century efforts to continue these reforms and another on the coming of the automobile and the ways cities were seen to be moving toward a new crisis in the years before and after World War II. There is a detailed analysis of Modernism, the scientifically based architectural style that produced mixed results in mid-twentieth-century cities. There are chapters on suburbanization, urban renewal and highway building, the revival of cities and New Urbanism, current health initiatives, and a final chapter discussing prospects for the future.

The central tenet of this book is that conditions were terrible in pre-industrial cities and large-scale growth caused by the industrial revolution

Table 1.1 Timeline of the built environment and health



made conditions worse, or at least vastly increased the magnitude of problems. Over time, a series of reform, health, and planning movements used existing knowledge and theories available to them to meet the challenges of their particular eras. During the two centuries covered here, conditions greatly improved, prompted by rising prosperity and new technologies, new ways of regulating the built environment, and changing conceptualizations of the nature of urban problems. The challenges also changed, shifting, for example, from infectious diseases to obesity or from downtown congestion to center city abandonment.

This book uses a variety of sources. For the earliest decades these include novels, artworks, historical accounts, and the many sanitary surveys that documented living conditions. It draws heavily on works on urban planning and public health, and on studies by European and US historians. The statistics are mostly descriptive rather than a result of modern epidemiological studies. The more recent actors profiled in this book are more likely to have left behind books and journal articles. These are used along with historical reviews. By the 1930s, there are increasing numbers of journal articles and in the 1960s, modern epidemiological studies begin to appear and predominate from that time forward, though many architecture and planning articles are also used. The research for this book took place at university libraries as well as through visits to the collections located at the Museum of Modern Art and the Art Institute of Chicago. It draws heavily on such sources as the *American Journal of Public Health,* the *Bulletin of the History of Medicine,* the *Journal of the Society of Architectural Historians,* and other similar journals.

There is a basic contradiction imbedded in any book on health and the built environment. A thousand words cannot adequately describe the tranquility of a neatly landscaped postwar suburb or the dynamism of a downtown office district at 8:45 on a weekday morning. An even greater challenge is to describe a past that no longer exists except in our collective memories and prejudices. What were early reformers trying to accomplish? What would we have done given their available tools and technologies? Would we have produced any greater health improvements? This book asks readers to understand other worlds, some long gone, some contemporary but still unexamined. The only way to experience a book on the built environment is also the only way to experience a city, suburb, or rural area: be a part of one's surroundings. In that way, one can reconsider one's own values, ideas, and assumptions. It is hoped, therefore, that this book will prompt people to rethink the environment around them.

CHAPTER 2

URBAN LIFE AND HEALTH IN THE NINETEENTH CENTURY

THIS CHAPTER BEGINS BY DESCRIBING HOW PREEXISTING unhealthy conditions were exacerbated by the industrial revolution in U.S. and European cities at the beginning of the nineteenth century. The industrial revolution prompted a growth in industrialization, immigration, and urbanization,[1] and as a result, pollution increased, sanitation declined, and housing and infrastructure were overwhelmed by rising population. Next is an account of how this situation led to a decline in health for many segments of the urban population and how many urban areas were also affected by significant civil unrest and periodic devastating fires. Altogether, these conditions set the stage for a complex crisis involving health, safety, and the environment.

The modern history of using architecture and the design of cities to promote and protect health in the United States may have started in the early nineteenth century, when the industrial revolution began, but the conditions in the cities at that time were very problematic.[2] As the urban historian Lewis Mumford pointed out, as the medieval era gave way to modern times and even before the industrial revolution, the health and environmental conditions of cities had begun to deteriorate (see table 2.1).[3]

THE INDUSTRIAL REVOLUTION

Beginning in the late eighteenth century in England and spreading to the United States and Continental Europe in the nineteenth century, the industrial revolution caused a rapid growth in urban population.

Table 2.1 Key dates in the beginning of the urban crisis

Event	Years
Industrial revolution begins	Late 18th century
Steam railroad passenger service begins	1825
Cholera epidemics	1831, 1849, 1854, 1866
Major Fires	
New York	1835
Chicago	1871
Boston	1872
Irish Famine	1845–1849
Year of Revolution	1848
Great Stink in London	1858
Draft riots in New York	1863
Paris commune	1871
Great stink in Paris	1880

Once-small cities expanded by hundreds of thousands or millions of new residents, overwhelming physical and administrative infrastructures.[4] The processes promoting urban growth severely affected the health of the people participating in that growth.[5]

New industries created pollution, depressed wages, and drew large numbers of people, many of whom were desperately poor, into the cities.[6] In the earlier stages of industrialization, the industries used water power, concentrating workers and economic activity near the rivers where power could be generated and thereby often polluting drinking water sources. Later, the introduction of the steam engine created opportunities for cities to grow at locations other than riversides, allowing the construction of vast industrial works in and around the old medieval cities in the case of Europe and around existing mercantile centers in the United States. As a result, cities began to be afflicted by pollution given off by industry.[7] Simultaneously, industrial growth created large neighborhoods of workers and their families within walking distance of the factories. Charles Dickens thus described a fictional industrial city, Coketown, in *Hard Times*:

> It was a town of machinery and tall chimneys, out of which interminable serpents of smoke trailed themselves for ever and ever, and never got uncoiled. It had a black canal in it, and a river that ran purple with ill-smelling dye, and vast piles of buildings full of windows where there was a rattling and a trembling all day long, and where the piston of the steam-engine worked monotonously up and down, like the head of an elephant in a state of melancholy madness.[8]

Interestingly, Lewis Mumford adopted the name Coketown for his archetypical industrial city in his landmark study of Western urbanism, *The City in History*.

As Karl Marx noted, production moved out of homes and workshops and into factories that were designed to facilitate a new means of production—the assembly line, with its standardization, repetitive tasks, and dehumanizing conditions. The increased efficiency cut the cost of consumer goods, but it also ended up reducing the value of work produced by unskilled and semiskilled laborers. Greater productivity in the factory also threatened the earning power of craftsmen and guild members, lowering their standard of living and making them at risk of sinking into poverty. Workers found themselves subject to the fluctuations in the cost of labor and commodities in the economy.[9]

As factory buildings had to be within walking distance of worker housing, there was minimal separation between housing and factories, and a factory could be next door to housing.[10] There were no laws or codes prohibiting a new industrial enterprise from coming into a neighborhood and there were few controls on the pollution it might emit into its surroundings.[11]

In *The Jungle,* Upton Sinclair described the atmosphere on the south side of Chicago as

> a vista: half a dozen chimneys, tall as the tallest of buildings, touching the very sky—and leaping from them half a dozen columns of smoke, thick, oily, and black as night.[12]

Friedrich Engels gave the following description of industrial neighborhoods in Manchester, England:

> The cottages are old, dirty, and of the smallest sort, the streets uneven, fallen into ruts and in part without drains or pavement; masses of refuse, offal and sickening filth lie among standing pools in all directions; the atmosphere is poisoned by the effluvia from these, and laden and darkened by the smoke of a dozen tall factory chimneys.[13]

The industrial revolution brought on substantial improvements to health and society, but it also created problems as it spread around the world. The public health historian George Rosen was to write,

> As in England and France, industrialization [in Germany] was ushered in by a slaughter of the innocents. Those that survived the cradle were given over to the tender mercies of the factory and the mine.[14]

IMMIGRATION

The new machines and production lines required large numbers of men, women, and children to operate them, but there were not enough native workers in the cities to fill the need for labor.[15] The native inhabitants of the cities included local craftsmen, who were trying to maintain their status; clerks and bureaucrats, who were finding new employment opportunities in the hierarchies necessary to manage the new industries; and the wealthy, whether landed aristocrats or the new industrialists.[16] Therefore, the new factories turned to rural populations, both domestic and foreign, for labor. Immigration brought in new people who were unaware of the need to modify rural sanitation practices or social mores to meet the challenges of urban living conditions.[17] Immigration also exacerbated class, racial, and religious differences and contributed to the increasing social unrest.[18]

Parallely, competition from better climates and soils in the Midwest devastated New England rural economies and dramatically altered the landscape as farms were abandoned and open areas reverted to forests.[19] Former farm families moved either west to the frontier or to the cities in search of work.

Fundamental economic disparities were exacerbated by economic and social policies that contributed to famine, pestilence, and poverty in places from Ireland and Scotland to Italy and Russia.[20] In addition, racial and religious persecution forced some sections of the populations to seek new homes. From the mid-nineteenth century until the end of the great migration at the beginning of World War I, 17 million immigrants came to the United States from Europe.[21] Polish parishes, Little Italies, Irish neighborhoods, and new Jewish communities developed in many U.S. cities.[22]

As vital to the economies as these immigrants were, they were not always welcomed by native, middle- and upper-class societies.[23] Immigrants to the United States were seen by some to be nonwhite, non-Protestant threats. Prejudice was particularly strong against the Chinese.[24] One medical historian has noted,

> But unlike other impoverished and crowded areas of San Francisco, in Chinatown poverty and its physical manifestations took on a particularly sinister brand of depravity. They became not merely an annoyance but a threat and a subject of fear as they became more pathologized.[25]

URBANIZATION

The result of industrialization and immigration was rapid urbanization, and for the first time in history, countries emerged where a majority of

the population lived in cities.[26] The effect on workers was to help create the rise of the urban proletariat.[27] The urban populations often could not cope with the pollution, disease, and filth generated in a landscape shaped by medieval infrastructure.[28]

Older, small cities and even entirely new industry-based cities began to develop into large metropolises. Sometimes these cities seemed to spontaneously grow as transportation hubs. New York City had been secondary to Philadelphia and Boston when independence was declared and none of the three were large cities by the standard of that era or our own. Then, bolstered in 1825 by the opening of the Erie Canal, New York became the prime hub connecting Europe and the interior of North America and assumed a position of industrial importance it would hold for over a century.[29] London, Paris, Berlin, and other older European capitals developed large industrial neighborhoods as manufacturing took advantage of easy access to markets and capital.[30] Chicago became a major shipping, food processing, and manufacturing center in just a few decades as railroads converged in the city and waterborne transportation routes connected it to markets to the east and overseas.[31] Smaller cities also developed. For example, Lowell, Massachusetts, was conceived as a new center for manufacturing textiles and shoes, and it became a center of new production techniques (figure 2.1).[32]

To give some idea of the growth of cities:

- London grew from 960,000 in 1800 to 4,000,000 in 1900 and 8,000,000 by 1950.
- Paris's population in 1800 was 550,000, and in 1900 it was 2,800,000.
- New York went from 60,000 in 1800 to 500,000 by 1850 and 7,900,000 in 1950.
- Chicago did not exist in 1800, but had a population of 1,700,000 in 1900 and more than double that by 1950.

While the economic roots of these cities were diverse, they shared the common problems of pollution, poor sanitation, and the need for large numbers of employees.[33] Cities were the center of both great wealth and great deprivation.[34]

SANITATION

The dependence on horses and mules to transport goods and individuals produced a steady supply of manure to the streets and open spaces of cities.[35] For the most part, streets were unpaved and without drains so garbage and animal droppings deposited on the streets stayed there.

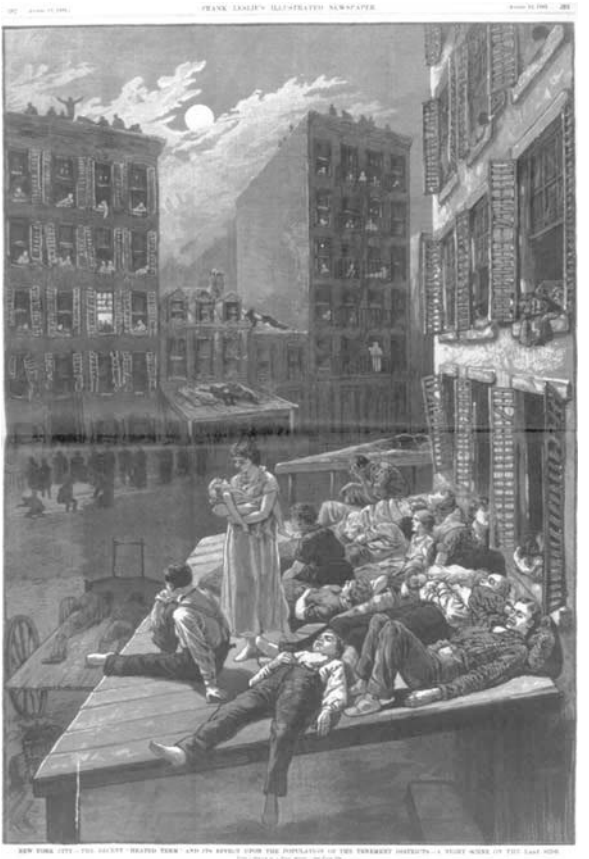


Figure 2.1 New York tenement on a hot summer night

Estimates for the amount of manure annually deposited in the streets of London varied from 25,000 to 120,000 tons. Henry Mayhew, in his study of London poor, classified the filth in the streets into dust from the grinding of wheels and stones, horse dung and cattle manure, mud, and surface water mixed with sewage.[36]

Many cities did try to hire people to clean up the manure and trash, but these efforts depended on the resources of local governments.[37] But as Martin Melosi pointed out in his studies of this era, solid waste disposal was expensive and difficult to manage.[38] In many cities, animals were allowed, or even encouraged, to scavenge in the streets and garbage piles.[39] Occasionally, cities put in sewers, but these were meant to drain storm water, not collect human and animal waste.[40]

Joel Tarr, a historian of sanitation wrote, "The two most critical elements relating to urban metabolism were water supply and human waste removal."[41] Human waste was supposed to be carted away, but in many neighborhoods, particularly the tenement districts, waste accumulated, and alleyways, spaces between buildings, and other areas with privies could be overflowing with feces.[42]

Clean water was scarce in many cities during this era. Water from local rivers was often contaminated. London had more advanced water systems than many other cities in the mid-nineteenth century, but it dumped its untreated storm water into the Thames and pulled in drinking water downstream from these outfalls.[43] Wells were dug, but primitive drilling technology limited how deep wells could go and the ability of pumps to draw up water was also not great. Furthermore, the groundwater under cities was as contaminated as the surface water. In one London slum near Leicester Square, drinking water was "drawn from cisterns which were receptacles for refuse, and perhaps occasionally a dead cat."[44]

Because clean water was not accessible and any water used inside houses had to be carried inside, personal hygiene was nearly impossible.[45] Doctors and midwives could not wash their hands, even if that had been a common practice, nor could residents be expected to clean themselves.[46] Perhaps this contributed to the high rates of maternal mortality in this era.[47] Records indicate that "Out of a total of 255,083 included in [The Tenement House Committee of 1894's] inspection, only 306 persons had access to bath-rooms (in those days a literal description) in their inspection; and at that time there was not a public bath in New York."[48]

Pollution

From garbage to factory pollution, the assaults on human health were ubiquitous.[49] In *Garbage in the Cities,* Melosi notes, "[U]rbanites were forced to confront massive pollution in many forms."[50] Studies of the toxic effects of chemical pollution would not become common for another 100 years, but new chemicals of the era, particularly dyes derived from coal tars, were often carcinogenic, or the cause of birth defects and xenoestrogenic effects. However, these were problems not understood in the nineteenth century.[51] Despite this lack of science, according to the 1850 report of the Sanitary Commission of Massachusetts,

> The smoke of furnaces, manufactories, and other establishments is often a great nuisance to a neighborhood and is supposed to be deleterious to health. It corrupts the air, and often renders it unfit for respiration.[52]

HOUSING

Housing conditions of the poor, already problematic at the beginning of the industrial revolution, deteriorated as immigrants moved into cities.[53] Poor housing spread in tandem with industrialization. Steen Eiler Rasmussen, in his book on the history of urban development noted:

> [O]n the continent the great land boom led to the standardization of these degraded conditions by the erection of whole districts of jerry-built tenement housing filled with flats in which there was no direct daylight or ventilation or even such simple ameliorations as access to a bit of garden or just a view of green trees.[54]

In the absence of anything more than rudimentary building codes, property owners could build whatever they could.[55] Landowners had a financial incentive to crowd as many buildings and as much construction on their properties as they could rent out.[56] A particular problem in many cities was the large percentage of a lot that could be occupied by buildings; in some cases two buildings were constructed on one long narrow lot with the two buildings sharing privies in the narrow space in between.[57] As a result, buildings were clustered around narrow, dark open spaces with little access to air, light, or circulation.[58] Andrew Mearns's nineteenth-century account of London slums described the deplorable conditions in these spaces:

> To get into [the tenements] you have to penetrate courts reeking with poisonous and mal-odorous gases arising from accumulations of sewage and refuse scattered in all directions and often flowing beneath your feet,—courts, many of them, which the sun never penetrates, which are never visited by a breath of fresh air, and which rarely know the virtues of a drop of cleansing water.[59]

The stench and filth were unimaginable.[60] Cellar dwellings, often near the water table and almost never with windows, offered the worst shelter.[61] A contemporary named Thomas Beames reported:

> Added to these causes of wretchedness is the natural lowness of the ground, which requires the utmost resources of science to obviate its inevitable results; flooding cellars, densely peopled, with loathsome streams accumulating in the gutters and kennel-stagnant refuse waters emitting abominable smells—and noxious vapours increased by heaps of garbage by the road-side;[62]

For the most part, employers did not develop housing for their workers. However, in England and Germany, factory owners did build some dwellings, while in the United States, the Pullman Company in Chicago built a model development for its employees that included decent housing, spacious community designs, and extensive worker services. The company hoped that the model community would buy labor peace, but it ran into the problem of worker unrest versus employer social control.[63] Thereafter, most company-supplied housing for workers tended to be in areas outside of cities where there were few alternatives.

Because of the shortage of affordable housing, worker families crowded into small apartments or shared with others.[64] In his nineteenth-century housing survey, Charles Booth reported, "In one little room no more than eight feet square, would be found living father, mother and several children."[65]

The poor housing conditions were not limited to the big cities. In the industrial suburbs, new industrial cities, and smaller manufacturing towns developing around the world, problems of sanitation, ventilation, and overcrowding quickly arose[66]. By the beginning of the twentieth century, the contrast between city living and suburban living was becoming extreme and many people began to believe that the single family suburban house was healthier than the apartment building.[67] As will be seen in the following chapters, this assumption was to help guide government policy, and popular opinion, well into the twentieth century. For example, it contributed to the Federal Housing Administration's standards for mortgage lending and the American Public Health Association's guidelines for healthy neighborhoods.[68]

HEALTH

In part because of their sanitation and housing problems, cities reported high mortality rates.[69] These cities depended on immigration to sustain or grow populations, and deaths exceeded births in most cities in Europe and the United States until the beginning of the twentieth century. There were cholera epidemics in London in 1831, 1849, and 1854. New York had epidemics in 1832, 1849, and 1866, and Boston experienced problems with diphtheria, measles, smallpox, and other diseases. Plague continued in San Francisco and Los Angeles as late as the early twentieth century.[70]

Poverty, poor housing, and ill health were interrelated. In 1891 the Royal Statistical Society published the results of a survey that found that 30.7 percent of London's population was poor and 31.5 percent lived in housing with more than two persons per room. The annual death rate was 27.1 per thousand.[71] In New York Jacob Riis declared that "hundreds

of men, women, and children are every day slowly starving to death in tenements."[72] The great epidemics and the slow toll of less dramatic, but more common, diseases were responsible for these high mortality rates.[73]

Animal and human waste spread diarrheal diseases.[74] As in modern-day examples of the consequences of poor sanitation, children were most at risk for dysentery, typhoid fever, and other diseases spread by feces and contaminated water.[75] Diphtheria, whooping cough, and other diseases were major killers of children as well.[76] Health advocate Lemuel Shattuck's 1850 report found that "In Boston, from 1840 to 1845, 48.62 percent, of all the deaths were those of persons under 5 years of age, in some classes of the population more than 62 percent, were under that age."[77]

Even what we now call "diseases of childhood" were deadly at that time. The death rates from all causes for children under five years old reached almost 150 per thousand in 1888 on some streets in New York City.[78]

There has been debate about the extent of health problems in the nineteenth century and the degree to which the public health interventions, outlined in the next chapter, contributed to solving them. Thomas McKeown and R. G. Record believed that there was a steady decline in mortality rates from the beginning to the end of the nineteenth century and they attributed only 25 percent of that decline in England and Wales to the sanitary reform movement.[79] But others have suggested that their analysis discounted the role of sanitary reform in curbing deaths caused by tuberculosis because they did not consider that improvements in health brought about by providing clean water might also boost the ability of bodies to resist tuberculosis infections.[80] Furthermore, a reexamination of the data suggests that mortality was highest in Britain around the mid-century mark.[81] Others have since found that though there was substantial annual variation, in general, urban death rates in the United States rose from the beginning of the nineteenth century and began to decline after 1870. By 1940, the excess of urban deaths over rural deaths had disappeared.[82]

Understanding of the forces behind these diseases was poor.[83] The dominant theory of disease causation was that of "miasmas," which held that odors could make people sick and diseases could be prevented by avoiding noxious smells.[84] For example, Lemuel Shattuck, the pioneering Massachusetts public health advocate, declared in1850:

> Refuse matter, either animal or vegetable, are constantly undergoing change, and giving out vapors and gases which, even in extremely small quantities, are injurious to health, especially if they are constantly inhaled. Conclusive proofs of this fact exist. Wherever there is a dirty street,

> court, or dwelling-house, the elements of pestilence are at work in that neighborhood.[85]

The stench of disease-afflicted cities may have helped make odors an etiological target.[86] Also adding to the air pollution problem, buildings could only be heated by coal, charcoal, or wood and the smoke of cooking and heating fires contributed to the overall smell of a city.[87] In the summer of 1858, the stench of London's River Thames was so bad that it became known as "The Great Stink."[88] Members of Parliament were badly affected as they met in the House of Commons beside the river. There was even thought of locating Parliament elsewhere, possibly in St. Albans or Oxford. Paris similarly suffered at a later date. In both cases, the stench was made even more intolerable by the fear that the odors themselves could cause disease. David Barnes, in his book on Paris's odiferous summer, noted:

> [T]he disgusting and poisonous odors of 1880 were also felt to be potentially or actually deadly. Illnesses and deaths were attributed to the Great Stink both by medical and scientific authorities and by lay observers, and the predictions of imminent epidemics were made on a regular basis.[89]

In the same era, Boston became so concerned about the stench of its Back Bay, a former tidal flat that had been dammed, that a major public works project was launched to fill it in and create a new community.[90]

TUBERCULOSIS

Rene and Jean Dubos, who wrote a history of tuberculosis, declared, "Tuberculosis was then [in the mid-nineteenth century] unquestionably the greatest single cause of death and disease in the Western World."[91] Caused by *Mycobacterium tuberculosi,* the bacillus is spread by inhalation or through consumption of infected food, particularly milk.

For most people, the bacillus has little effect beyond having the potential to produce an immunological reaction, the basis of the modern tuberculin skin test, but for some, particularly those with immune systems weakened by underlying poor health or poor nutrition, the disease can progress to full tuberculosis. Thus the poverty and overcrowding of cities helped tuberculosis spread and kill.[92]

The tuberculosis epidemic peaked around 1870 in New York City, Boston, and Philadelphia with a rate near 400 deaths per 100,000 persons per year. Manchester, England, reported almost 600 deaths per 100,000 in 1890.[93] These are crude death rates, not adjusted to our

current population structure, but they would be equivalent to 1.2 to 1.8 million deaths annually in the United States today. Compare this to the current total number of deaths from all causes in the United States of about 2.5 million and an annual toll of cardiovascular disease of about 650,000.[94] Tuberculosis and the deaths caused by it were ubiquitous, but the ability to avoid the disease was limited. Or as an early twentieth writer put it, "The extermination of tuberculosis is a social not a medical problem."[95] The connection between immigration, poor housing conditions, and tuberculosis persisted well into the twentieth century. Panel 55 of *The Great Migration,* Jacob Lawrence's series of paintings documenting the movement of African American from the rural South to the urban North and Midwest, is captioned, "The migrants, having moved suddenly into a crowded and unhealthy environment, soon contracted tuberculosis. The death rate rose."[96]

CHOLERA

Another great health problem of the nineteenth-century city was cholera. A cholera epidemic caused panic and incited flight from a city, anyone who could would flee at the first sign of an outbreak. The resulting business paralysis made cholera an economic as well as a medical problem. Charles Rosenberg wrote extensively about the great nineteenth-century cholera epidemics, their causes and consequences. He pointed out that the epidemics provoked major crises: "For cholera is an unnerving disease, its symptoms revolting, its etiology an indictment of the society which harbors it; a grim reminder of man's mortality, it could not be ignored, or treated, or prayed away."[97]

Cholera is caused by *Vibrio cholera,* another microbe adapted to take advantage of poor sanitary systems and breaches in the human immune system. Chlorination and secure separation of waste from drinking water can eliminate the risk of cholera epidemics, but of course there were no such technologies available in the middle decades of the nineteenth century.

Epidemiologists eventually found that cholera had been endemic in India for thousands of years, but isolation, and perhaps weaker virulence, had kept it from spreading outside that locus.[98] New trade routes facilitated the transport of the bacteria around the globe via infected persons. Cholera killed 22,000 in England and Wales in the 1831 epidemic, 53,000 in 1849, and 20,000 in 1854.[99] In one town in England, Newburn, cholera sickened one person in two and killed one in eight.[100]

Striking a year after it first appeared in London, the spreading cholera epidemic did not appear in the United States by surprise. It was observed

month by month spreading across Europe and Canada before finally appearing full force in the United States.[101] But little was done to prevent the epidemics from breaking out, partly because of political incompetence, but also because the will or technology to provide clean water and get rid of sewage was not a priority.[102] Ultimately, the disease was as deadly in the United States as it was in Europe. St. Louis lost 20 percent of its population. In New York, Rosenberg quotes an observer of one epidemics as saying,

> Cartloads of coffins rumbled through the streets, and when filled, returned through the streets to the cemeteries. Dead bodies lay unburied in the gutters, and coffin-makers had to work on the Sabbath to supply the demand.[103]

MENTAL HEALTH

As the nineteenth century progressed, observers became aware of the mental health impacts of urbanization.[104] The most obvious manifestation of the stresses of modern life was suicide, but other forms of mental illness such as schizophrenia and depression were recognized. This led to new ideas about mental health and its relationship with urban living. Emile Durkheim (1858–1917) was one of the most famous of these early psychologists who sought to describe the alienation and disruptive factors in cities that led to mental illness. He coined the term *anomie* to describe the dislocating effects of leaving the close social strictures of village life for the dehumanizing and debilitating crowds of the city where no social structures were available to facilitate healthy living and behavior. Later theorists expanded the concept of anomie to have it explain a wide range of urban and sociological pathologies.[105] They held that partial assimilation, adopting the goals of the new urban society without acquiring the means to achieve them, set the stage for crime and other antisocial behaviors.[106] In the mid-twentieth century, as will be seen in Chapter 6, these studies were given new empirical force by studies on rats and overcrowding.

MORAL HEALTH

The moral issues in cities were similarly great. At a time when moral health was not seen as separate from physical health, immoral behaviors included alcohol consumption, public drunkenness, illegitimacy, and lewdness.[107] *Morality* and *hygiene* were believed to be closely related, and at times, such as when referring to prostitution, the terms became almost interchangeable.[108] Many descriptions of slum living conditions in the nineteenth century stress the numbers of people sharing sleeping

arrangements and the lack of marital bonds. For example, Andrew Mearns encouraged his readers to

> Ask if the men and women living together in these rookeries are married, and your simplicity will cause a smile. Nobody knows. Nobody cares. Nobody expects that they are.[109]

Fires

Fires were a major risk in many nineteenth-century cities. Interiors were illuminated by candles or oil lamps, cooking and heating relied on wood, charcoal, and coal. Wood was a common building material and roofs often had wood shingles or thatch. London burned in 1666, New York in 1835, Chicago in 1871, Boston in 1872, Baltimore in 1904, and San Francisco in 1906.

Major conflagrations were not the only threat; there were constant small household and single building fires that would result in horrific losses of life in the packed tenements. Jacob Riis reported the results of one building fire:

> Thirteen half-clad, apparently lifeless bodies were laid on the floor of an adjoining coal office, and the ambulance surgeons worked over them with sleeves rolled up to the elbows. A half grown girl with a baby in her arms walked about among the dead and dying with a stunned, vacant look, singing in a low, scared voice to the [dead] child. [110]

The fires posed a threat not just to people but to commerce as well. Businesses could be ruined when inventories were destroyed, rendering their owners penniless. Cities struggled to find solutions to the problem, turning to primitive building laws and organizing volunteer fire departments. But water to fight fires was hard to get, knowledge of how to build truly fire-resistant buildings was limited, and volunteer fire departments were not up to the task of fire suppression and prevention.

Civil Unrest

The new urban proletariat did not passively take to these conditions. During 1848, for example, many European cities experienced a series of revolutions, strikes, and unrest. There were many causes of the unrest. But most important was the rising tides of industrialization, immigration, and urbanization that produced new demands on old societies.[111]

As conditions deteriorated, many cities expected violence and the revolutions of 1848 were widely anticipated. In the months before the revolutions, small-scale riots and unrest had been reported throughout

the core of Europe including Poland, Switzerland, and widespread Italy. In Eastern Europe there was agitation against the Austrian Empire; in Central Europe there was a movement for a united Germany.[112]

The revolutions ultimately failed to overthrow the established social order, but they succeeded in provoking some people into believing that civilization and propriety were at grave risk.[113] "The middle classes in particular were frightened by radical propaganda and the apparent threat to property."[114] In response, some allied themselves with the forces fighting to restore order in the cities and lost sympathy for the poor. The repression that followed was sometimes as violent as the rebellions themselves and often bloodier. Disillusioned, but not surprised by the inability of the 1848 rebellions to force change, Karl Marx solidified his objections to capitalism and the status of working people. In the failure of the year of revolution, Marxian communism was born.[115]

The United States did not participate in the 1848 wave of rebellion, but this did not mean it was immune from urban violence. It had its own great urban uprising, the New York City Draft Riot of 1863. The roots of the unrest were located in the waves of migration sweeping into the city. New York City was transformed by a combination of large-scale immigration, whose members were forced or voluntarily moved into large ethnic enclaves, and the rise in property values, through which the well-to-do were displaced out of growing commercial districts to newer areas further uptown.[116] The Irish had established neighborhoods throughout southern Manhattan, but they had yet to achieve political and economic power. On the eve of the Civil War, there were substantial sympathies toward the South as New York merchants and bankers were heavily dependent on the cotton trade and on the sale of manufactured goods to the less industrialized rural Southern economies. The city had voted Democratic during the election of the Republican Abraham Lincoln and the war began with layoffs as Southern trade routes were disrupted.[117] Then as the war progressed, inflation eroded the purchasing power of the poor. Another problem was the ongoing racism against Blacks. Though New York was a free state, the economic and social status of Blacks was very low.[118] However, their lack of power and prosperity did not prevent them from being resented. Furthermore, there was great concern among unskilled Irish workers that newly freed Black competition would drive down wages and push them out of jobs. But the immediate issue that provoked the riots was the inequity of the Civil War conscription laws that allowed wealthy would-be draftees to purchase their way out of the draft, something the poor Irish, who felt that they bore no responsibility for slavery or the war, could not afford to do.

The riots lasted for two days. During that time, public buildings and the homes of prominent supporters of the war were attacked, numerous

buildings burned, and newspapers threatened. But a special animosity was directed at New York's Black community. The riots only ended with the arrival of federal troops.

The extent of the violence was widespread. Over 1,000 White rioters died; Black deaths were not counted, but probably were in the thousands.[119] A Black orphanage was attacked and while most of the children were safely removed, tragedy still happened.

> Furniture was hacked apart with axes, draperies were torn down, even the few cheap toys left behind by children were carried off or smashed to bits. One frightened little colored girl, somehow overlooked in the exodus, had hidden under a bed. They found her and they killed her.[120]

In addition to murder, the mobs sometimes mutilated the corpses afterwards, with particular attention paid to the sexual mutilation of murdered Black men.[121] Blacks were not the only targets, the mobs turned on those trying to restore order or protect the innocent targets of mob action. "Policemen caught in the riots were often stripped and literally defaced—beaten on the face and head until unrecognizable."[122] Other targets were business owners and industrialists who were thought to be profiting from the war while they had the resources to keep their sons out of the way of harm. Mob violence had threatened not only the United States' largest city but the war effort itself.

Workers organized and fought for improvements in wages, housing, and working conditions. But it took decades for their conditions to improve. In the meantime, labor strife added to the perception that cities were unsafe. One event typifies the extent of the effort to improve working conditions and the backlash this could provoke, the Chicago Haymarket Riot in 1886 in which the police fired into a crowd and a number of radicals were sentenced to death. The urban planning historian, Christine Boyer noted:

> Concentrated and industrialized conditions seem to exacerbate social tensions into violent strife—between capital and labor, among wage earners and the unemployed, among native Americans and immigrants—so that by the 1890s it was apparent that the harmonies of a free market system and an open and fair democracy were imperfectly tuned.[123]

Thus as the industrial revolution grew in force, its health, social, and environmental impacts intensified. How cities began to address these problems is the story of the next chapter.

CHAPTER 3

NINETEENTH-CENTURY REFORM MOVEMENTS

THIS CHAPTER BEGINS WITH A DISCUSSION of how medical science struggled to understand the effect of built environment on health. Then it outlines how these efforts contributed to a developing reform movement that eventually resulted in the passing of the first laws to regulate the built environment as well as creating the public health profession. Next it covers how urban environmental health problems helped prompt new types of domestic architecture for the well-off and sparked the tenement reform movement. Then other efforts to meet the environmental challenges of the nineteenth-century city included Baron Haussmann's rebuilding of Paris and the urban parks movement in the United States led by Frederick Law Olmsted and others are detailed. The chapter moves to the "model tenement" movement and settlement houses established to assist the poor. Then it covers the end-of-the-century work of Louis Sullivan and colleagues, who created the skyscraper, a new technology which would contribute to concerns regarding the contribution of density and congestion on health. Then the chapter features the great Columbian Exposition of 1893 in Chicago and the City Beautiful movement. The chapter concludes with the rise of urban coalitions to bring in freshwater supplies that resulted in dramatic improvements to health and sharply reduced the risk of fires.

The health and environmental conditions in nineteenth-century cities, the disease, lack of sanitation, and poor housing seemed overwhelming.[1] Contributing to the challenges, there were few tools that were available to protect and promote public health. As we will see, however, reformers, architects, and others, energized by the promise of a new scientific age, devised theories of social action; created new forms of architecture;

Table 3.1 Key dates in the age of reform

Event	Years
Southwood Smith Treatise on fevers	1830
Chadwick report	1842
New York croton aqueduct	1842
Lemual Shattuck report	1850
Haussmann rebuilds Paris	1852–1870
John Snow on Cholera	1855
Central Park opens	1859
Jane Addams founds Hull House	1889
Great Columbian Exposition	1893

designed parks and public works; and eventually contributed to the development of the professions of public health, city planning, and social work. Most important, they established the principle that societies could improve health by modifying the built environment. They also left important legacies in buildings, neighborhood forms, and monuments; lasting policies that continue to shape development to this day; and ideologies and values that even in our time continue to influence how people view cities and respond to urban problems. By the end of the era, cities that we would recognize had come into being (see table 3.1).

The Development of Medical Science

As the nineteenth century progressed, modern medicine began to take shape in England and France. Its growth was encouraged by the diseases in the tenements of Paris and London, and arose out of the concern for the pressing health problems that afflicted all segments of society, but particularly the poor.[2] One influential medical person at this time was Thomas Southwood Smith (1788–1861), a physician, minister, and early sanitary reformer.[3] While his ideas were derived from miasma theory and he invented a detailed taxonomy of fevers caused by animal and vegetable matter decomposition, Southwood Smith also declared that the risk of transmission of disease was increased by overcrowded housing. He wrote, "The room of the fever-patient, in a small and heated apartment in London, with no perflation of fresh air, is perfectly analogous to a stagnant pool in Ethiopia, full of the bodies of dead locusts."[4] This was a step forward in the theories of environmental causes of disease. No longer were solutions to be found in draining nearby marshes or shifting the location of a city such had been the practice in Roman times, now disease risk could be modified by changing factors inside a city itself.[5] Building on

this new paradigm in further writings, Southwood Smith declared that the miasmas in dwelling units could be mitigated by providing proper ventilation and sunlight to houses.[6] Through this advancement, Southwood Smith established the medical science rationale for the built environment–disease chain of causality, and his treatise on fevers and his advocacy for improved housing inspired others to look at the built environment as a locus of disease. His work placed science at the service of social reformers and set the stage for making the health of tenement dwellers a legitimate concern of public policy. As will be seen, for the next 100 years a major goal of housing reform and much of urban planning and architecture practice would be to improve access to sunlight and ventilation. The first step would be to use Southwood Smith's ideas regarding medical science to challenge the dominant political ideologies of the mid-nineteenth century.

The Sanitary Reform Movement

Reformers began to search for solutions to the urban health problems, but they were stymied by a lack of laws and regulations.[7] What could be done to challenge the dominant ideologies of this era, such as laissez-faire? These included the belief that government had no right to interfere with property rights and that the markets could be trusted to eventually achieve the goal of improving environmental conditions.[8] Many thought that government had no proper role in alleviating the suffering in urban slums and that there was no justification for laws to impinge on the freedom of landowners to provide any sort of housing that workers would rent.[9] Nor should government interfere with property rights by mandating or building infrastructure.[10]

Reformers had to work to override these concerns and create a new political constituency to counterbalance them. As Martin Melosi pointed out in his study of waste disposal, changes in attitudes must precede action to improve environmental conditions.[11] And Joel Tarr noted that building city infrastructure is highly dependent on political processes.[12] So first, the reformers inspected tenement district conditions and produced reports intended to get the public to understand the enormity of urban problems. Second, the reformers pressed for legislation allowing for public inspection and regulation of housing occupied by the poor. In the third step, reformers mobilized the public to demand the professionalization and training of the inspection workforce.[13]

To motivate the public the sanitary surveys included descriptions of young, innocent women forced by circumstances of poverty and overcrowding to share beds with fathers, brothers, and male boarders.[14]

Disease statistics were carefully computed and correlations with tenement living conditions meticulously set forth (contributing to the growth of the field of statistics).[15] These surveys helped the public to internalize the soon-to-be dominant assumption that the built environment was responsible for the high rates of disease and death in the slums.[16]

There were other forces responsible for the rising tide of what was to be called the sanitary movement. Some members of the middle and upper classes, many closely tied to business interests, were aware of the conditions in the tenement districts and were determined to find solutions.[17] The idea of slum reform connected to the belief that cities were in a competition to be the most modern and in this context the cleanup of cities, the improvement of sanitation, and the proper regulation of working-class housing were seen as a sign of social progress: higher civilizations were cleaner.[18] These beliefs helped prompt action by advancing the proposition that modern cities must be clean cities.

EDWIN CHADWICK AND THE PROFESSION OF PUBLIC HEALTH

The modern English effort to modify the built environment and to eliminate the worst conditions in the slums was begun by Sir Edwin Chadwick (1800–1890), who had a great influence on public policy during the mid-nineteenth century both in England and in the United States. Like Southwood Smith, he was a follower of Jeremy Bentham and his *utilitarianism* philosophy. The utilitarians based their justification for public action on the grounds that policies should maximize the public good: they held that the best policies were those that produced the most happiness for the most people. To Chadwick and the Benthamites, tenement reform was not a moral crusade but a simple matter of efficiency.[19] They believed that if English factories were to find workers, if the expenditures on the poor were to be minimized, and if England was to find enough soldiers to man its empire, then there was a need to improve the health and social conditions of the tenements. This new ideology became part of the effort to challenge the old assumptions about the limited role of government.[20]

Chadwick authored *The Report from the Poor Law Commissioners on an Inquiry into the Sanitary Conditions of the Laboring Populations of Great Britain* in 1842.[21] In this report, he described in detail the housing and working conditions of the people whose labors made possible the English industrial revolution. Chadwick brought together the many separate strands of the British reform movement, combining those who directly cared about the poor with those who feared that they might succumb to the diseases centered in the tenements to those who simply

did not want their workers to die because of the difficulty of hiring replacements.[22]

Southwood Smith had documented how poor housing was hurting workers. Therefore, Chadwick argued, it was necessary to clean up the slums in order to provide a healthy workforce for England's factories. Chadwick laid out the case that because the built environment was killing and sickening slum dwellers, it was necessary to regulate tenements to correct the worst of these conditions. Next, he reasoned that these regulations, focusing on light, ventilation, and sanitation, would need a skilled professional workforce, health officers, in every locality in England to enforce them. To meet this need, Chadwick called for the appointment of local medical officers throughout the country who would be responsible for improving sanitary conditions. As a result of this proposal, the public health profession was born. It was popular to call these professionals *sanitarians,* a label that reflected public health's concern with the filth of that age.[23]

The idea of sanitary reform quickly spread to the United States. In New York City, John Griscom conducted a survey patterned after Chadwick's work.[24] Then inspired by Griscom and Chadwick, Lemuel Shattuck produced a study of health conditions in Massachusetts.[25] These later surveys copied and built on the methods of the reports that preceded them.[26] Following Chadwick's example, Shattuck used the problems of housing to establish a new public health infrastructure. Almost all the modern functions of public health were described or advocated for in Shattuck's report: professional public health administration, the collection of vital statistics, programs to ensure clean food and drugs, special programs to promote maternal and child health, and infectious disease control.[27] Building on Southwood Smith's work, Shattuck stressed the need for sunlight and ventilation to stop the spread of disease. Again following Chadwick's example, Shattuck called for the appointment of Boards of Health and the passing of a strong collection of laws and regulations.[28] Shattuck's study resulted in the establishment of the Massachusetts Department of Public Health, the first state health department in the United States.[29]

Just as in England, the reports helped to change public opinion about tenements and the slums in the United States perhaps because, "The studies had an air of objectivity designed to erase the last possible lingering doubts about whether the extremely squalid and degenerate conditions of the popular image of tenements truly did exist in the confines of those districts."[30] Very important, the sanitarians helped promote the creation of a basic government function: alleviating the suffering in city slums. The new public health professionals would track and discover disease,

find cases in an epidemic, and later administer the vaccines that were to relieve the burden of disease. They established the right and responsibility of government to promote health, regulate food and housing, and eventually regulate the disposal of pollutants into the environment.[31] These efforts would contribute to the development of the labor movement, with its concerns for worker safety and industrial hygiene. Thus in response to the problems of the nineteenth-century city, the public health movement had begun.

JOHN SNOW, CHOLERA, AND THE BEGINNINGS OF EPIDEMIOLOGY

Though many believed that the built environment was a cause of disease and suffering in their cities, the exact mechanisms of its transmission were not yet known.[32] For example, despite cholera victims suffering from diarrhea, medical authorities at the time debated how the disease was passed from victim to victim. Was it the result of breathing miasmas? Or was it caused by drinking contaminated water? Contributing to the inability to resolve the controversy between miasma and contagion theories was that there were no scientific techniques to study the cause and spread of disease in a population until John Snow (1813–1858) began his investigations of cholera.[33]

Snow conducted two studies that helped identify the association between cholera and drinking water and, in doing so, established the science and practice of epidemiology.[34] Nineteenth-century London had a number of companies providing drinking water of varying quality to the population, many of which used River Thames as their sources. While in most parts of the city only a single water company provided water to everyone, in sections of south London, two companies provided water and their customers lived side by side. Prior to the 1849 cholera epidemic in Britain, Parliament had passed a law requiring water intakes to be moved up river so that the visual and aromatic quality of the water would be improved. The law gave companies time to make the change so at this point in time, one of the south London water companies was drawing water from above the city while the other was still supplying downriver water. Therefore, one company had a more secure water supply than the other. Snow recognized that the control group in the study, in this situation the clean water company customers, must match the case group, the dirty water company customers, as closely as possible in order for etiologic inference to be made.[35] Snow devised a detailed methodology to test his theory. He went door to door in south London, establishing which buildings had cholera cases, which had none, and who drank water from

which company. He found that cases of the disease were more prevalent among people who drank water supplied by the company that had its intake further down the Thames than the other. Because they came from the same neighborhood, the controls matched the cases in every aspect but the variable he was testing, the water. If disease rates had been similar, then water was probably not responsible for the spread of cholera, but since they were so much greater in houses served by the one company, this was strong evidence for the water supply being contaminated.[36]

In another study, Snow found that victims of an 1854 outbreak of cholera in the Soho section of London were associated with drinking water from one particular pump on Broad Street. During the epidemic, Snow went door to door to ask victims or next of kin where they drew water from. It turned out that most were getting their drinking water from a pump on Broad Street, even including a woman who lived several miles away but who preferred to drink water from her old neighborhood and arranged to have it delivered. Snow persuaded the authorities to shut the pump down and the epidemic ebbed. Later investigation found the well to be contaminated by a cesspool draining the house of one of the first victims of the epidemic.[37]

Despite Snow's fame as a physician and his having publicized his studies in letters, articles, and a book,[38] his theory failed to gain widespread acceptance during his lifetime.[39] This was because the work of a special commission charged with investigating his claims that water was the transmission vehicle for cholera placed the responsibility for the epidemic on miasmas, in part because the commission based its decision on a faulty analysis of mortality data by the statistician William Farr.[40] Also, the contagion theory was problematic because it went against the dominant health assumptions of the mid-nineteenth century.[41] The lack of bacteriological science was another barrier and no one had examined cholera diarrheal discharges to see if there were bacilli in the water. In the absence of an agent that could be identified in the water that was responsible for carrying the disease, scientists did not believe that contaminated water supplies carried risks separate from their bad tastes and smells. On the other hand, bad smells were particularly strong in the poorer sections of cities where the epidemics tended to be worse. Thus the observational evidence appeared to be on the side of miasmas.[42] Robert Koch did not isolate the bacteria that caused cholera until 1883 and it was only after Snow's death that his theories on the transmission of disease through contaminated water became accepted. But Snow's work survived and his methods established how public health professionals and epidemiologists should investigate disease and attempt to understand patterns of illness.[43] As will be seen, these epidemiological methods, refined but

still in use today, are very distinct from what other professions were to develop.

NINETEENTH-CENTURY DOMESTIC ARCHITECTURE

Rising affluence and a growing concern with the health problems of the built environment were to contribute to a change in housing, at least among those who could afford the new designs. Architecture was not yet a credentialed profession in the early nineteenth-century United States and influential architects such as Boston's Charles Bullfinch struggled to make a living.[44] Schools of architecture did not become widespread in the United States until after the Civil War and those who wanted to study architecture often went to Europe to attend the Ecole des Beaux Arts in Paris or visit the ancient and Renaissance buildings in Florence, Venice, and Rome.[45]

Despite these limitations, domestic architecture began to incorporate the responses to the environmental conditions in US cities. A major architectural legacy of the mid- to late nineteenth century is the row house, particularly in the northeast.[46] The houses varied in size and could be fairly small or large even by the standards of the twenty-first century. Many of the row houses were vernacular architecture, built without the assistance of an architect, and they varied substantially in quality.[47] But some were designed by architects or experienced developers and many incorporated contemporary ideas about health and good living. The row house was designed to allow maximum sunlight and ventilation, Southwood Smith's two critical defense measures against miasmas. While the details could vary, row houses tended to be single family, multiple story, attached brick or stone buildings.[48] Families and guests entered the main floor, the parlor level, from a high set of steps that protected the inhabitants from the mud and filth of the streets. Under the stairs was the entry for the kitchens and the servants. The basement kitchen prevented cooking odors, smoke, and noise from reaching upstairs while thick common walls helped fight the spread of fires. In Boston, bay windows enhanced ventilation and sunlight. Elsewhere, flat facades that included windows in the front and back of the building served that purpose. Despite large families and numerous servants, row houses provided ample space for occupants because some approached 4,000 square feet or larger. Sometimes the stables were several blocks away from the houses, keeping the flies, noises, and smells away from these middle-class and wealthy homes. Sometimes, the row house represents one of the first waves of suburbanization and the movement of upper-income households out of the central parts of cities.[49]

The Tenement Reform Movement

If some members of the urban middle and upper classes were moving to single-family row houses designed to maximize health, the poor still tended to live in the lowest quality dwellings.[50] Therefore, many of the initial housing reform efforts focused on tenements, sometimes defined as any multistory apartment building, but usually only referencing those multistory buildings occupied by the poor. However, one, two, and three family buildings, usually exempted from early housing reform laws in order to spare small homeowners with only a few rental units the burden of bureaucratic oversight, were often just as bad as the larger buildings.[51] These early laws often had limited goals, and at first rarely made more than minimal efforts to address concerns regarding fire, light, ventilation, and sanitation.[52] The tenement problem was primarily caused by the fact that the working poor could not afford decent housing and so were forced to crowd into small apartments in order to afford prevailing rents. Unaware of the economics of affordability, urban reformers were surprised by the density of immigrant districts. Jane Addams remarked, "If the tenement house density of the three districts investigated were spread throughout the city, we could house within our borders 23,000,000 people."[53]

To the reformers, the social and health problems of the nineteenth century seemed to be concentrated in the tenements and so they sought to focus the growing public concern regarding the built environment on this type of housing. Calling for the elimination of tenement districts, one religious reformer declared:

> If we are to prevent immorality, crime, disease and premature death; it is for us to blast at the roots of these ills in the social body, and if we are agreed that the tenement house, with its swarms of heterogeneous peoples, and its promiscuity of living conditions, is the prolific breeder of these ills, then it must follow that the tenement, as we know it, must go.[54]

The tools to address the tenement problem, however, were limited.[55] At first, reformers publicized the terrible housing conditions to shame owners into clearing up their properties. In New York City, for example, it was found that wealthy mainline Protestant churches owned some of the worst tenements, but church leaders disassociated themselves from the hardships of the slums. Thus when it was revealed that Trinity Church, one of the most prominent Episcopal Churches in the city, owned hundreds of tenements, church officials fiercely denied it had any responsibility for improving the depressing conditions of its properties.[56] The issue was not to be solved until the next century.

Baron Haussmann and the Rebuilding of Paris

Some thought that the way to improve cities was to rebuild them. In this view, the way to address the poverty and dilapidated housing of the slums was to demolish and replace them with new dwellings for the rich and middle classes. One city that dramatically altered its built environment in response to the conditions of the nineteenth-century slum was Paris under Baron Georges-Eugène Haussmann (1809–1891).[57] Few urban designers have had the opportunity and the budget given Haussmann by his patron, Napoleon III. Even rarer was the then prevalent Beaux Arts tradition that influenced his choice of materials and forms. In addition, it is important to consider that Haussmann's plans for Paris were influenced by the long history of French culture and humanism, built on an aesthetic that cherished cities and were meant to create out of a living and flawed city, a perfect capital of the most advanced state and society of its era.[58] The boulevard form itself precedes this era and even in the eighteenth century, well before Haussmann, there was an "urbanist impulse" to sanitize the city through visual improvements.[59] The health goals were to open dwellings and expose them to sunlight and air and to bring sewers to more areas of the city.[60]

Previously, Paris was a warren of small, dimly lit streets, choking in traffic and dangerous. The plan aimed to connect major monuments and solve the city's traffic problems; create fashionable, well-ventilated and sunlit streets; and promote public order by allowing the quick movement of troops to put down insurrections.[61] Building and implementing Haussmann's plans involved massive demolition and dislocation.[62] Any building along the straight line path between two of his selected monumental points had to be pulled down. The demolitions necessary for the construction of the boulevards displaced almost 10 percent of the population, mostly the poor. While property owners were compensated for their losses, the poor tenants were not. Businesses were lost, social patterns were dislocated, and the remaining tenements were even more overcrowded.[63]

Again, Europe influenced the United States. Boston designed a whole new neighborhood on the French model, the Back Bay, which ultimately eclipsed the English garden-inspired South End as the center of Boston's upper-class urban life. The tidelands belonged to the Commonwealth of Massachusetts under state law, so the state had a major role in its planning. In addition to strict architectural guidelines that mandated row houses and bay windows, the Back Bay district proper had no commercial land uses or even stables. It was to be a home for the well-to-do and middle classes (see figure 3.1).[64]

Figure 3.1 Commonwealth Avenue Mall, Boston

The Parisian model of massive slum clearance also caused problems in places it was adopted.[65] In Berlin, for example, it resulted in cramped buildings that covered too high a percentage of the ground behind the boulevards. As housing prices increased and workers, whose incomes were not rising to meet the new shelter costs, put pressure on the buildings through overcrowding, the newly built apartment buildings began to deteriorate down toward the level of the housing they had replaced.[66]

URBAN PARKS

Slum housing was not the only perceived urban problem associated with the lack of access to sunlight and ventilation. The densities and growth of cities also prompted an awareness of the lack of open space. In the United States, the movement to build parks was encouraged, in part, by the work and theories of Frederick Law Olmsted (1822–1903). In designing his parks, which we will see had many influences including his concerns about health, he not only left a legacy of beautiful public open spaces but also helped create the profession of landscape architecture.[67] Part

of the reason for his lasting influence was his optimism that the built environment could be manipulated by humankind to promote better health.[68]

Olmsted tried farming and travel reporting before becoming a landscape architect. He toured England and was heavily influenced by its parks and gardens. Olmsted was also the first executive director of the Civil War Sanitary Commission, a nongovernmental group that sought to improve health conditions in Union forts and encampments.[69]

In Olmsted's mind, a park had to be a natural area and the formalism of older parks had little appeal to him. Yet untamed nature was not his goal and he took his inspirations both from the carefully planned Paris of Haussmann and the heavily modified English countryside.[70] Olmsted created a series of carefully planned and executed human–made landscapes that evoked a romanticized pastoral setting. There was no raw wilderness. On the contrary, every vista was meticulously planned, each tree, boulder, and grassy meadow orchestrated to provide a complex natural effect. This was a highly human-made version of the natural. He developed his ideas out of the reform movements seeking to improve cities and he thought that rational landscape planning could be an important tool for change.[71] Olmsted preached that the landscape design should be in unity with the design of buildings. He also believed that an orderly built environment would make cities more livable and would begin to address the problems of nineteenth-century urban living. Furthermore, he embraced an egalitarianism that underlay his belief that all people could enjoy his parks. Parks then and now were thought to be important socializers, promoting middle-class values and behaviors among the urban poor.[72] Olmsted firmly believed he had developed the antidote to the problems of urbanization and "he was so pleased with the benefits of the park for all the people of the city, that he went down to Lower Manhattan, where the poor immigrants lived, and distributed handbills telling them about the new park and inviting them to use it."[73]

There were health considerations underlying the development of urban parks. If cities were congested and the lack of open space resulted in few opportunities for physical activity and clean air, then building parks was a response to the health problems of cities and the urban poor.[74] The concept of health was consistent with Southwood Smith's ideas that sunlight and ventilation were the keys to prevent disease.[75] Olmsted wrote, "Air is disinfected by sunlight and foliage. Foliage also acts mechanically to purify the air by screening it."[76]

One of Olmsted's most important projects was New York City's Central Park, which he developed with Calvert Vaux. The era also saw the

development of large urban parks including those in Brooklyn, Cleveland, Philadelphia, San Francisco, and Boston. These parks were designed to be the "lungs of the city" democratically available to all and a masterpiece of domination of human over nature.[77]

Model Tenements

Undiscouraged by the magnitude of the tenement problem, reformers tried to create examples of superior alternatives to slum living, the model tenement. The underlying assumption was that these models would demonstrate to property owners that tenement housing could be both healthy and profitable. It would communicate to the general public and middle-class constituents for reform that housing conditions were not caused by tenants but by property owners who were unable or unwilling to build healthy housing.[78] The stated goal was "philanthropy at 5%," the wealthy could both perform charity and make a profit at the same time.[79] This offered the possibility of enlisting reform-minded businessmen into the effort to alleviate the problems in the tenement districts.[80] However, the first model tenements were hardly improvements on existing slum housing. Later, they provided lasting, healthful alternatives to conventional development.

There were model tenements built in London, New York City, Philadelphia and elsewhere. Efforts to build model tenements in Boston date back to the mid-nineteenth century, when Charles Elliot Norton built a very financially successful building, but its inhabitants were skilled rather than unskilled laborers; the rents were too high for slum dwellers. Another more successful effort, built in 1875 through money left by one of the builders of the new industrial town, Lawrence, Massachusetts, still stands in Boston's South End.[81]

Overall, the model tenement movement failed because building new housing of sufficiently high quality without government subsidies was too expensive for the working poor, much less the destitute.[82] Factory workers could not afford the model tenements and the economics of housing affordability were not yet well calculated. Nor did the lure of 5 percent return on equity draw new capital into housing construction and the reformers could not build enough housing to meet the demand for quality affordable housing.[83] The problem of substandard housing in cities was too great, and the resources available to the reformers was too small.[84] As will be seen in the next chapter, ultimately, reformers were to abandon building model tenements and turn to the development of building codes and standards.

Settlement Houses

The social and health conditions associated with rapidly growing cities prompted the development of a number of important disciplines in addition to public health. Partly in response to the social problems in slum districts, and partly as a potential solution to bring better health to the poor, a new field emerged: social work. This movement had influences in England where Octavia and Miranda Hill, granddaughters of Southwood Smith, contributed to the idea of forming specialized locations where the poor could go to receive assistance and moral improvement. The settlement house movement had at its core that it was possible to relieve suffering through short-term assistance and education for the poor on how to improve their circumstances.[85] Settlement house workers also brought an optimistic view of the housing crisis to their work. Poverty and poor housing were not inevitable or innate; they were something that could be educated against. The settlement house workers saw a need to teach people how not to be poor and how to keep their tenement homes clean. A perhaps similar social theory today is the idea of a "culture of poverty": the poor are poor in part because they have not adopted the goals and behaviors of middle-class people.[86]

In the United States, the settlement house movement was promoted by Jane Addams (1860–1935), who founded Hull House in 1889 on the west side of Chicago, one of the poorest districts in the city. Hull House provided job counseling, taught English to immigrants, sponsored clubs for young women, and showed people how to clean and maintain their apartments. Out of these efforts were to grow the field of social work and the range of social services that are available today: mental health, child protective services, child care, drug counseling, and other related services. As will be seen, settlement house workers were to be part of the coalitions that contributed to the development of new housing codes and zoning in the twentieth century. Their legacies include community-based institutions that assist the poor, the elderly, and the ill. Housing and public health reforms were part of a broader range of social reforms in this era such as universal schooling and public investment in infrastructure.[87]

Louis Sullivan and the Development of the Skyscraper

Increased urban development, as well as new building technologies, was to further bolster the congestion of city cores and eventually contribute to increased efforts to modify the built environment to protect health. As the industrial revolution matured, there was a growing demand for

lawyers, stockbrokers, bookkeepers, and other office workers to staff and serve the needs of corporations. These workers clustered together in central business districts and created a demand for a new architectural form: the office building.[88] To meet the challenges of bringing large numbers of office workers close together, the skyscraper was conceived in Chicago and adopted in New York City, San Francisco, and throughout North America before having worldwide applications.[89]

A number of people contributed to the development of the skyscraper. An early influence was Louis Sullivan (1856–1924), who famously said "form follows function," a dictum that continues to drive architectural theory and criticism a century after he first uttered the phrase.[90] He saw skyscrapers as the embodiment of America's new business aesthetics and ideals. Building a skyscraper required the solution of a number of extremely difficult technical problems and prompted the use of steel, elevators, and new foundation technologies. New heating and ventilation mechanisms allowed buildings to grow in size and volume.[91]

But multistory apartment and office buildings were also thought to create problems by adding to congestion, increasing densities, and blocking access to sunlight and ventilation.[92] Thus as will be seen in the next chapter, by the beginning of the twentieth century, there began to be concerns that their shadows would have negative health and environmental impacts while others worried about how congestion might harm the long-term economic viability of cities.[93]

The 1893 Columbian Exposition

One of the major nineteenth-century influences on US architecture and urban planning was the Columbian Exposition of 1893 in Chicago, a world's fair to commemorate the 400th anniversary of Columbus's discovery of the new world. Chicago had beat out other cities to host the fair in 1890 and then was confronted by the challenge of organizing and mounting the fair in a very short time period.[94] The responsibility for planning the fair fell on Chicago architect and planner Daniel Burnham (1846–1912), who designed the Flatiron Building in New York and Union Station in Washington. For the fair, he tapped some of the greatest architects and designers of the age including Olmsted, Charles McKim, George B. Post, and Richard Morris Hunt (figure 3.2).

The fair's design was based on a nineteenth-century romantic version of classical Europe set on the lakeshore south of the Loop. Rectangles and squares lined with formal white buildings that shared a common

Figure 3.2 The Columbian exposition 1893

cornice line gave the whole fair a unifying serenity. The planners established broad plazas, expansive walks, and stately buildings.[95] After a slow start, millions came to the exposition and it was to dominate the public's tastes for decades.[96]

The fair was also to have a restrictive effect on US architecture, forcing architects including Frank Lloyd Wright to wait for another time when their designs might be appreciated and establishing neoclassicism, which uses Greek columns, Roman arches and vaulting, decorative pediments, and marble and limestone, as the favored architecture for courthouses, banks, train stations, and other major public buildings for the next 50 years.[97] All but the most conservative architects in the United States were to have problems receiving commissions.

The great fair also provided new ideas regarding the possibilities of urban living. In response to its glamour, cities and local business leaders sought out the best designers to demonstrate their progress and to compete with other cities.[98] The contrast between the crowded slums and the spacious White City prompted citizens to question their own city governments when they returned home and encouraged efforts to remake cities into ordered urbanity instead of chaotic slums.[99] Energized by the fair, architects turned their attention to the squalor of the cities and

they developed new plans to address the problems of the slums and the burgeoning downtown commercial districts.[100]

One of the most famous of these was Daniel Burnham's plan for Chicago, one of the first comprehensive urban visions for a US city since Pierre Charles won the competition to design Washington.[101] Olmsted had conceived of urban parks systems that often included grand processional boulevards, but he had never expanded his vision to include the totality of the city. In contrast, Burnham brought all the strands of what made a city a functional living space together and decided where and how the different elements were to relate to each other.[102] His plan for Chicago was sponsored by the Commercial Club, demonstrative of how business interests supported the early city planning movement.[103] When it was published in 1909, the plan had a large impact on the city. It included Chicago's lakefront parks; a series of forest preserves in the suburbs; and provisions for freight, railroads, and docks.[104] Though it was not implemented in its entirety, it continues to provide inspiration and guidance to Chicago. Burnham's famous quote is "Make no little plans. They have no magic to stir men's blood." Through his Chicago plan, he helped make the public believe that a better city was possible.[105]

Moving outward from the Columbian Exposition to become a major force behind the development of US urban planning was the City Beautiful movement.[106] Born in the late nineteenth century, but reaching its greatest influence in the twentieth, it was a style that sought to create broad boulevards, elaborate public buildings, and neoclassical architectural forms in cities.[107]

The City Beautiful movement inspired new projects including the revitalization of L'Enfant's plan for the mall in Washington (in part, the result of Burnham's work), Philadelphia's Benjamin Franklin Parkway, and San Francisco's civic center area.[108] A new profession, that of city planning, built upon the successes of the Chicago Exposition to argue for elaborate projects that combined government, cultural, and other large, expensive, and bureaucratic functions.[109] Urbanologist Lewis Mumford criticized the City Beautiful movement for being all about grandeur and not about the real day-to-day activities of a city. In the minds of these realists, the historical economic and social forces that created cities were not derived from romantically inspired long axial boulevards and grand public buildings; rather, they were centered on the commerce, the interaction, and complexity of urban living.[110] However, City Beautiful ideals continue to this day and there is the argument that cities have an obligation to build themselves in aesthetically pleasing ways.[111] The legacy of the City Beautiful movement can be seen in the numerous public buildings and carefully designed streetscapes dotting US cities.

CLEAN WATER

Even in the absence of a contagion theory of disease, city residents feared the putrid smells, foul tastes, and clouded waters from wells and taps.[112] But it took almost a century to bring clean water into the tenements, and slum dwellers continued to suffer from waterborne diseases well into the twentieth century.[113] Bringing water was more important for many civic leaders at this time as there was the pressing need to find enough water to stop the toll of fires on people and property. It should also be noted that the private sector, businessmen, and property owners were often at the forefront of the effort to improve city water.[114]

Eventually almost every growing city had to confront the challenges of finding clean water supplies. The effort was encouraged by a growing population of middle- and upper-income residents who demanded clean water and proper sanitation. Chicago, for example, had a problem of fouling its water supply with its sewage outfalls. Despite efforts to extend its intake pipe far out into Lake Michigan, sewage dumped into the Chicago river kept contaminating drinking water, so Chicago reversed the course of the river, preventing it from dumping its raw sewage and industrial waste into Lake Michigan by sending the river down toward the Mississippi. New York City found its water in the Croton watershed while San Francisco took its water from the drowned Hetch Hetchy valley in the Sierra Nevada.[115] Boston first tapped the local Nashoba River, and eventually, the city's water district created the massive Quabbin. Reliable, safe water supplies enabled cities to grow and prosper.[116]

Moving water (water supply) to the city was one problem; delivering water (water distribution) to each city residence and removing waste water (sewage collection) from buildings posed separate challenges. Indoor plumbing began to spread throughout American cities by the mid-nineteenth century, at least for the well-to-do. The poor, of course, could not afford it; plumbing was highly dependent on household income.[117] Even for the rich, however, the progression to modern sanitation was slow and incremental. Connecting new water supplies to new water closets produced large new streams of liquid human waste, which at first simply drained into the narrow backyards where the privies once stood. This created problems of sewage from water closets flooding the cellars of buildings and the problems of smells and filth continued.[118] So there were attempts to connect water closets to storm sewer systems. However, these sewers had been built only for rain; they were not sized to handle liquid wastes and these connections often backed up sewage into houses. Engineers then redesigned sewers to handle both storm water and waste, but that produced large outfalls of raw sewage into rivers, lakes, and bays.[119] This problem is still not entirely addressed in the United States; even after

the passage of the Clean Water Act in 1972, which finally made water treatment the norm for most public sewer systems, there are continuing issues with water quality.[120]

However they thought how disease was transmitted, both sides of the miasma–contagion dispute had reasons to associate filth with disease. The miasma believers thought fecal matter caused disease through its putrefying odors while the contagionists believed filth fostered the spread of disease-causing agents.[121] In this context, the very existence of plumbing vexed the living conditions of some of the wealthy who could afford it. Even if it wasn't backing up sewage, primitive bathroom fixtures released noxious odors.

This was before there were plumbing codes, apprenticeships, and licensing programs for plumbers or other building trades, or standardized plumbing fixtures field-tested to demonstrate their efficiency at draining toilets and keeping sewer gasses out of homes. "Careless-joined pipes, inferior fittings, badly-constructed traps, and unventilated soil pipes cannot fail to admit the sewer gas into our houses, which becomes a prolific source of disease and death."[122] The solution to the problem of sewer gas coming from drains and toilets is the trap, an ingenious idea that uses water to seal the air connection between sewer and house, but this took time to become the standard in the United States.[123]

Despite the presence of factories in their midst, nineteenth-century the public tended to be more concerned about the problems of human waste than it was with industrial pollution.[124] However, there were efforts to isolate industrial pollution, at least from middle-class neighborhoods. This cleaned up the air in some communities by concentrating it in others.[125] It is important to remember, however, that there were no laws against discharging pollution into the air or water except for simple nuisance codes, knowledge of the health impacts of pollution was limited, and workers could not live beyond walking distance from their jobs because they could not afford transportation. As with fecal contamination, industrial pollution was a burden until the Clean Water Act began to place limits on pollution discharges.[126] Only then did the great age of water pollution finally come to an end. And the legacy of the contamination lingers in the sediments and dead zones of many rivers and streams.

Human waste was one problem, solid waste was another. Clearing up the garbage in city streets was only possible if municipal governments could be effectively organized to get rid of it. The old piecemeal efforts of medieval and early modern cities were not up to the task.[127] Slowly, cities either adopted systems of municipal garbage pickup or used private contractors to dispose of household waste. Eventually, the public came to demand garbage pickup.[128]

The efforts of sanitary reformers to rid cities of human and solid waste were to have tremendous positive impacts on health and quality of life. However, it is important to remember that the sanitary reform movement was also motivated in part by racism, xenophobia, or both. For example, in San Francisco's Chinatown, epidemics worked to reinforce the image of that neighborhood as a center of disease. It had to be contained, cleaned out, or destroyed.[129] Sanitarians, though they considered themselves trained impartial experts, did not always rise above the prejudices of the society from which they were imbedded.

Health Impacts

The effect of improved sanitation, along with rising incomes, on the health of people in US cities was dramatic. Mortality in the United States declined precipitously as modern sanitation spread. Some examples of these health improvements include the following:

- Chicago's death rate fell by 60 percent between 1850 and 1925 and clean water may have been responsible for 30–50 percent of that decline.[130]
- In US cities overall, the introduction of clean water supplies was responsible for almost half of the reduction in total mortality, three-quarters of the drop in infant mortality, and almost two-thirds of the reduction in child mortality.[131]

These improvements would continue well into the twentieth century:

- US mortality rates fell by 40 percent from 1900 to 1940 while life expectancy at birth rose from 47 to 63 percent.
- The introduction of clean water reduced overall mortality by 50 percent, infant mortality dropped by 75 percent, and child mortality fell by two-thirds.[132]

The pattern was similar in other Western countries. While mortality rates increased through the middle of the nineteenth century in German cities, by the beginning of the twentieth century they declined markedly, in part because clean water reduced the occurrence of diarrheal diseases. Death rates declined in other countries as well:

- Life expectancy at birth in Paris increased by nearly 50 percent from the beginning of the nineteenth century to the beginning of the twentieth.[133]

- Belgium, Sweden, and the Netherlands also had declines in infant mortality at this time.[134]
- Male death rates in England and Wales peaked around 1830. By 1920, they had fallen by about 75percent.[135]

An important factor driving this decline in mortality was the reduction of deaths due to enteric diseases in infants.[136] With clean water, a city's environmental quality quickly improved and cleaner water meant fewer diarrheal diseases in children. Along with better nutrition, this reduced the incidence or severity of other diseases and led to increased health and growth of children.[137] Reducing the incidence of typhoid fever, which is spread by contaminated water, was considered to be a key factor in this mortality decline.[138] For every death from typhoid fever, it is thought that there were three or more deaths from other causes that were also prevented.[139]

Similarly, the death rate from tuberculosis began to decline. Much of the credit for that could be given to better nutrition, new standards of food safety, as well as the general improvement of the health of the population due to rising incomes and clean water.[140] However, housing improvements and reduced overcrowding also contributed to the improvement. By 1930, the death rate from tuberculosis was about 25 percent of what it had been.[141] But it wasn't until well into the twentieth century that medicine could actually extend life and wellness. Antibiotics did not become widespread until after World War II and surgery was not really possible and beneficial until the mid-twentieth century.[142]

Conclusion

Thanks to the hard work of reformers, social workers, architects, and engineers, cities looked dramatically different in 1900 than they did in 1850. Some of the worst housing conditions had been regulated out of existence, spacious parks and broad boulevards had been constructed in many cities, and virtually almost all large Western cities had taken steps to secure clean water supplies. The health and environmental conditions in cities began to improve and they successfully challenged the dominant political ideologies of their day to establish the right of government to regulate housing to protect health. They also produced a change in prevailing values so that cities were thought to be worthy of public expenditures to beautify them. But though the Progressive reformers played an important role in linking the physical problems of the late nineteenth-century city to the social ills that produced them, they failed to overcome the fundamental causes of

both the slums and their inhabitants' behavior: a social-economic-political system that methodically exploited millions of vulnerable people.[143]

The reformers had demonstrated that change was possible and as the twentieth century began, a new generation of architects, tenement reformers, social workers, and public health advocates would work together to once again dramatically change how cities were built.

CHAPTER 4

HOUSING LAWS, ZONING, AND BUILDING CODES

INTRODUCTION

THIS CHAPTER DESCRIBES THE DEVELOPMENT OF HOUSING LAWS, zoning, and building codes in the beginning decades of the twentieth century. First, it surveys the range of solutions that were tried at the beginning of the century, focusing on the trend toward shifting responsibility for housing safety from tenants to property owners. Then it explores the efforts to create the right of government to regulate housing. Next, it outlines the movement to establish zoning, the main way in which localities shape the built environment. This is followed by a discussion of building codes, another fundamental tool by which government enforces health and safety. The chapter concludes with a description of how public health and urban planning grew apart during the middle decades of the twentieth century.

The first several decades of the twentieth century were a time of rising prosperity for many segments of American society and the increasing numbers of middle-class households demanded improved environments and better housing.[1] Many cities also benefited from coalitions of business interests who came to believe that carefully crafted land use ordinances could safeguard property values and promote profitable city growth.[2] Thus the stage was set for a new way to organize and regulate the built environment.

SUCCESSES AND CHALLENGES

Across the United States, the newly created and energized health departments had striking successes, but vast areas of substandard housing still

Table 4.1 Key dates of housing laws, zoning, and building codes

Event	Years
Jacob Riis How the Other Half Lives published	1891
New York City model tenement law	1901
First National City Planning Conference	1909
Daniel Burnham's Plan of Chicago	1910
National Housing Association founded	1911
New York City zoning ordinancec	1916
Model zoning ordinance	1926
Supreme court decides Euclid v. Ambler	1926

existed in most cities.[3] Cellar dwelling units were often banned, and over time, many urban buildings were connected to sewers.[4] However, the results were far from what was needed. Often, the new laws resulted in indoor plumbing, but bathrooms were being shared by multiple units and many units had no sinks, bathtubs, and the other "conveniences" that made hygiene possible. So despite sanitary reform laws, a substantial portion of the urban poor and millions of factory worker families continued to live in substandard housing conditions.[5] New York City, for example, struggled to find the right laws to regulate housing. The city repeatedly tried to implement legislation addressing housing abuses, and over time, maximum permissible lot coverage was reduced and minimum standards for ventilation were established, though these standards were only haphazardly enforced.[6] Reformers would need new legal mechanisms if they were to further make inroads against substandard housing.[7]

By the end of the nineteenth century, the special housing problems faced by African Americans became evident. Blacks were not yet heavily segregated, but they often had to live in the poorest neighborhoods of cities in some of the worst housing.[8] W. E. B. Dubois described the hardships of urban life for many Blacks, their often substandard housing and overcrowded neighborhoods.[9] But his concerns were ignored and housing conditions were to remain very troubled as the great migration of African Americans from the rural South to the urban North and Midwest began during World War I.[10]

Remedies to improve housing conditions continued to be limited, however. Under common law, cities had the right to regulate building structures in order to ensure they did not collapse into the streets and to prevent fires.[11] By the end of the nineteenth century, this meant that many cities had mandated such innovations as brick construction, fire walls between buildings, fire-resistant facades, or small setbacks between buildings. Important, however, was the fact that these codes were legally

based on this very narrowly defined need to protect the public against only the most serious catastrophes.[12] Prior to the 1900s, the regulation of housing conditions often failed because they could not be connected to either common law nuisance legal doctrines or the newer sanitary laws, and thus deplorable conditions persisted.[13] In a sense, cities could only regulate housing from the building envelope out. Cities had limited authority to regulate housing from the building envelope in. Altogether, the laws that Chadwick, Shattuck, and others promoted had resulted in the elimination of some of the worst housing conditions, but only if the remedy being sought could be linked to large-scale, dramatic epidemics such as cholera and tuberculosis.[14] Unfortunately, the less spectacular killers, the deadly but commonplace diseases such as dysentery and diphtheria, did not present the emergency preconditions for housing enforcement so there was little the sanitarians could do to address them at this point.

The lack of sanitation for millions of urban residents and its resulting burden of morbidity and mortality could not be addressed by existing laws. One very important trend that was to ultimately strengthen the position of new reformers was the transformation of liability laws. Over the course of the nineteenth century, there was a change in legal doctrine where responsibility for providing safe and healthy housing was shifted from tenants to landlords. Until this shift, tenants, considered by the courts to be knowledgeable and willing purchasers of services, were held responsible if anything went wrong with their housing. For example, they could not even sue their landlord if a staircase collapsed. Eventually, however, reformers succeeded in convincing legislatures and courts beginning in the mid nineteenth century that it was the landlord who should bear legal and fiscal responsibility for safe housing.[15] There was a practical side to these efforts: given their small financial resources, the poor could not have possibly afforded to improve their housing conditions. Once property owners were responsible for the conditions of their units, reformers had a new target for improving housing quality.

Enforcement Issues

A latter wave of reformers (working in the last decades of the nineteenth century) had other concerns. In addition to the trouble with legal mechanisms to improve housing, there was also a problem with enforcement of the limited existing housing laws.[16] As urban populations grew, there was an accompanying increase in the need for municipal services. But many cities lacked skilled professional staffs to provide these services. The police were typically the only organized, large, city-employed labor force, so they were often called on to enforce the sanitary laws. But given that the police

were also responsible for many other tasks, they could hardly be expected to maintain the health and safety of the growing cities as well.[17] Housing protection also needed a workforce skilled in housing and health issues, something the police could not provide.

In many cities, building departments were responsible for enforcing regulations for new construction, but these departments were often underfunded and suspected of graft. Reformers complained that buildings that should never have been allowed to be occupied wereleft unregulated.[18] The reformers were not happy with the fiscal and personnel conditions in many municipal health departments, either. Many tended to have cyclical funding, rising in the face of epidemics and dropping again once the danger passed.[19] Many health departments were often constrained by law and custom to focusing on the identification and alleviation of illness. Reformers, intent on improving housing inspection services, searched for alternative enforcement mechanisms. There was a need for both new laws and better ways of enforcing them.[20]

However, some of the first efforts to enact housing codes created as many problems as they aimed to solve.[21] The dumbbell tenement, for example, was born out of a competition meant to encourage better designs for New York City's standard 25 × 100 foot lot. The winning design was codified into building standards by the Tenement House Law of 1879 and dominated the city's housing construction for the poor for the next 20 years.[22] But the new dumbbell tenements were very problematic: their minimum width requirement for air shafts was only 28 inches and rooms were allowed to be only 60 square feet. Furthermore, one room could serve as access for the next.[23] Hundreds of thousands of these tenements were built.

Other cities also made progress in their battles with their slums, but again, improvements were slow and not always on target for what tenement dwellers needed. For example, Boston created its building code, but poor housing conditions remained a problem in that city. New England reformers saw their failure to eradicate the slums as a reflection of their inability to make over the city in their image as a progressive modern metropolis.[24]

The Tenement Law Movement

New efforts to improve slums were launched as the nineteenth century ended. Reaching back to the initial efforts of the sanitarians, journalist Jacob Riis (1849–1914) helped to mobilize a new reform movement by investigating the problems in New York City tenements. Riis was born in Denmark and migrated to the United States in 1870, starting off as a

carpenter before finding his life's vocation, photojournalism. He used one of the prime tools of Chadwick and the other sanitarians: motivate the public by producing detailed reports on the conditions in the slums. He added to this a new technology not available to Chadwick: photography. His 1891 book, *How the Other Half Lives,* offered a graphic recapitulation of the health and dwelling conditions in New York tenements along with detailed descriptions of Italian, Irish, Jewish, and other ethnic enclaves.[25] Through this book, Riis was to help move public opinion and set in motion early twentieth-century slum reform.[26]

This effort to find legal solutions to tenement housing problems was to reach a climax in the years after 1900. A central figure in this coalition to address the problems of tenements and slum districts was Lawrence Veiller (1872–1959). Veiller was born in Elizabeth, New Jersey, and worked with the East Side Relief Work Committee and the New York City's Buildings Department. He made it his life's work to change how people lived in this country. Veiller, along with many other of the housing and sanitary activists of his time, saw city ills as an inevitable consequence of urbanization. He blamed immigration, which led to an increase in population. This in turn caused the construction of tenement buildings, which resulted in the other problems associated with urban living at the time.[27] Underlying his activism was the strong assumption that environmental influences on human behavior and health were paramount (figure 4.1).

Looking at what others had done to address slum conditions, Veiller rejected past efforts and sought new answers. For example, Veiller condemned the model tenement advocates, saying they had a "lack of imagination."[28] To Veiller and his allies, the model tenement movement started by Octavia Hill and her associates had simply failed to produce enough housing to make an impact. In 1900, for example, out of a total tenement population of almost 1,600,000 only 10,000 persons were housed in model tenements in New York City.[29]

So what was to be done? The answer, according to Veiller, lay in the making of new detailed housing laws and strict enforcement procedures.[30] Existing regulations, developed from common law and partially modified by sanitarian legislation, were inadequate. So the tenement reformers set out to convince the state of New York to enact a strong tenement control law. They again used Chadwick's strategy of conducting studies to motivate the public and develop a constituency for reform. As a first step, a tenement house commission was appointed by then governor Theodore Roosevelt in 1900 with Robert deForest as chair and Veiller as secretary. The two men produced a report that found five major problems with the tenements: lack of light and ventilation, lack of indoor plumbing for washing and sanitation, fire danger, overcrowding, and foul cellars

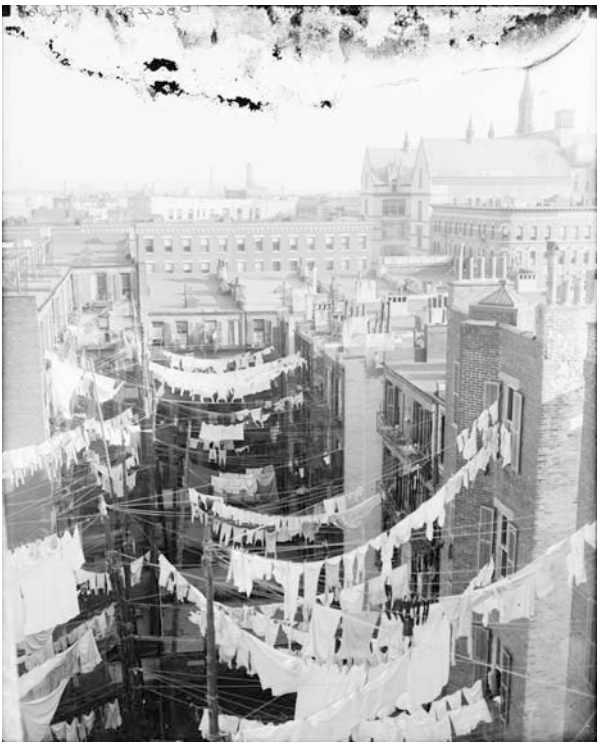


Figure 4.1 New York tenement district

and courts. Their report, called for three policies: legislation to guide the development of new tenements, rehabilitation and rebuilding of existing tenements, and strict inspection of existing and new tenements.[31] Veiller grounded his proposals for improving housing quality in public health:

> There is not very much use in taking people from a hospital, apparently restored to health, and sending them back to some slum, putting them into a dark room, where they never see daylight, or letting them live over an open sewer; we all know that in two or three weeks we shall have them back in the hospital, in as bad a condition physically as they were before.[32]

Veiller and deForest, backed by Governor Roosevelt and a coalition of reformers, next wrote the groundbreaking New York City Tenement House Law of 1901. Eventually, this legislation would be used as a model for housing codes for the entire United States.[33] It was difficult to pass the legislation and the arguments against the tenement laws in 1900 and

1901 included claims that they were arbitrary, expensive, and unfair to owners who had built or purchased their buildings in good faith and who were in compliance with existing laws.[34] Veiller responded by launching a large-scale lobbying campaign that included organizing a tenement house exhibit to demonstrate to the nonpoor of New York just how bad slum conditions were. But the bill passed only because of parliamentary tactics that overcame opposition to reform.

Model Housing Laws

The 1901 tenement law was written to address the housing needs outlined by the tenement house commission and contained provisions for fireproofing, cellar-dwelling regulations, and light and ventilation standards (including minimum window openings for rooms and hallways that were much larger than had been required in the dumbbell tenements).[35] The law called for making indoor plumbing mandatory in each unit of new construction and requiring at least one bathroom per every two apartments in old buildings. The law limited the amount of building footprint on a lot, and set overcrowding limits. It created enforcement mechanisms including the requirement of a building permit for alterations or new construction, certificate of occupancy permits that could be granted only after final work was inspected, fines and imprisonment for violations, and, most important, the creation of a tenement house department to administer and enforce the law.[36] Finally, it contained special sections to limit prostitution; the reformers thought that prostitution operating out of tenement buildings had a particularly damaging effect on the morals of the young. With the passage of Veiller's law, modern housing regulation was born.

The new law resulted in important changes in New York City's housing stock. In the 11 years after the passage of the 1901 law, housing conditions in New York City began to dramatically improve. The number of "school sinks"—privies located in the backyard of tenements in lieu of indoor accommodations—declined from 9,000 to 375. The number of "dark rooms," those without ventilation, went from about 350,000 to 76,000. Accompanying the improvement in housing conditions was a decline in mortality from 20.057 per thousand in 1900 to 14.11 per thousand in 1912.[37] These health improvements were not only because of better housing but also because of the general improvement of living standards adn the growing demand for higher quality residential environments. It should be noted that despite this rise in quality, substandard housing was not totally eliminated in New York City. A decade later, 9 percent of the new law tenement units lacked a bath, and another 4 percent had

a bath but it was shared by multiple units in the building.[38] Therefore, much additional work would be needed in the future.

Veiller's efforts did not stop with the passage of the tenement law. He also organized and ran the city's tenement house department from 1902 to 1904. DeForest and Veiller published a book on New York's housing problems and their model tenement law in 1903, *The Tenement House Problem,* which argued that the best way to address inner-city housing conditions was through the enactment and enforcement of these new laws. Upon leaving the employ of the city, Veiller went on to be the director of the Tenement House Committee of the Charity Organization Society, a post he used as a platform for promoting his laws in New York and elsewhere.

There was also much work to be done across the United States. Although housing conditions were poor in most inner city slums, they differed in important ways from place to place. With a few exceptions, Boston, Cincinnati, and Hartford, for example, most cities' tenement districts consisted of small one- or two-story buildings.[39] So Veiller modified his laws to meet the challenges in these other cities and in doing so, he sparked the creation of a national housing movement.[40] Through this national work, Veiller influenced almost all the new state and local laws that were adopted in the first 20 years of the twentieth century.

One important recommendation from the initial tenement commission report was lost, however. There was no provision for the construction or rehabilitation of housing in Veiller's model tenement laws. If enforcement failed to upgrade the tenements, there would be no parallel effort to increase the supply of healthful housing.[41] As will be seen in Chapter 7, this lack of a construction program would ultimately limit the positive benefits of the law and would set back the provision of safe, healthy, publicly financed housing in the United States for decades.

Veiller continued to discredit competing ideas that other social reformers proposed for improving tenement conditions. For example, in the introduction to *A Model Housing Law,* Veiller wrote:

> How delightful it would be to be able to believe that all that is needed to bring about proper housing conditions is a change in the economic status of the working people! That given enough wages, slums would vanish![42]

Perhaps Veiller reflected the values and ideology held by some in the developing urban planning profession, rather than those of his social work roots or the also evolving field of public health.[43] In general, planners were moving away from social work and the idea that there were social determinants of health.[44] Many tended to believe that the betterment of cities would be the result of laws and regulations, properly implemented

and strictly enforced, rather than of addressing social and economic inequality.[45]

Some reformers could be racist and nativists, and they were not above using public prejudices about immigrants to push for their reform agenda. For example, many of the reformers and their allies thought that Jewish and Catholic immigrants were inferior to White, native-born Protestants.[46] Reformers sometimes mixed these fears of the immigrants with their concern about their housing conditions, and the results of these reforms on tenement residents were to establish the legal right for many of the negative as well as positive aspects of twentieth-century urban reform.

As Veiller extended his work throughout the country, he wrote *Housing Reform: A Hand-book for Practical Use in American Cities* to encourage more cities to take action. Veiller, with the support of the Russell Sage Foundation, helped found the National Housing Association (NHA), a nationwide network of reformers advocating for new laws on the local and state level.[47] Organized at a conference in Boston in 1911, the NHA reached out to other prominent urban activists; its honorary board included Jane Addams, Frederick Law Olmsted, Jr, and Jacob Riis.[48] Through the NHA and a constant round of speeches across the county, Veiller lobbied states and cities to address their slum problems. During World War I, he was the head of the US Housing Commission, responsible for solving the housing problems posed by wartime mobilization. Local housing movements, inspired by Veiller's writings and actions, became adept at organizing coalitions to enact new laws. He prompted them to conduct their own housing surveys and use public pressure to force legislatures and cities to act.

Throughout his career, Veiller distinguished the old building codes, which detailed how buildings were to be constructed, from his new housing codes, which outlined how buildings were to be lived in. As Veiller traveled around the United States, he made the strengthening of the housing inspection function of health departments a priority.[49] In a move that was to have important consequences during the urban renewal era, Veiller's model law made city health department the primary enforcer of the housing codes.[50] He counted on the professional expertise of health inspectors, visiting nurses, and others to provide the vigilance and impartial rigor he saw necessary as promoting healthy housing. The laws resulted in important improvements and some cities succeeded in forcing the removal of some of the worst housing problems. Cincinnati, for example, eliminated its 21,000 outside vault privies in the years after adopting the model legislation.[51]

But the post–World War I era saw the diminishment of Veiller's influence. The NHA held its last conference in 1924. The decline of NHA was hastened by the extreme reluctance of Veiller and his allies to support

the use of federal money to build low-income housing.[52] By then, the European example of publicly financed housing construction began to influence other housing advocates. But Veiller rejected public housing construction on economic and practical grounds. It was not possible, he thought, that a city could ever afford to build the amount of housing that was needed.[53]

Ultimately, Veiller helped eliminate some of the worst conditions of the slums and he succeeded in making housing regulation an accepted government function. However, just like the model tenement movement he rejected, his housing law approach failed to eliminate a substantial portion of the substandard housing in US cities. He was stymied by the scope and scale of the housing problem as well as the reluctance of housing and building departments to apply his new laws to old buildings. So in 1936, long after his tenement reform law was passed, there were still almost 70,000 old law (built before 1901) tenements containing 500,000 units and housing well over 1,000,000 people in New York City. In addition, the tenement laws had little effect on overcrowding, which was seen as a particular evil of the time.[54]

Similarly, the national effort to adopt model housing laws had mixed results. By 1913, the standard organization and responsibilities of housing inspection departments had been thought out and illustrated by example. These departments needed trained inspectors, clear lines of authority, a knowledge of the moral and physical value of decent housing, adequate record-keeping systems, and a plan for periodic inspections of housing including the targeting of entire blocks for inspection and even midnight inspections to ensure against overcrowding.[55] But despite these efforts, local pockets of slum conditions persisted. In Philadelphia, for example, there were over 42,000 outdoor privies still in use in 1914.[56]

The Problem of Land Use Regulation

Housing was not the only serious problem affecting cities at this time and parallel efforts were initiated to address issues associated with the problematic and incompatible development of cities. Thus Veiller's housing coalition was not the only reform force changing cities in these decades. Alongside the housing law movement, an effort began to implement new mechanisms for regulating land use in cities.[57] This movement was to result in another important legacy of the era: the zoning code, which has largely determined the nature and scale of city and suburban development for most of the United States since the 1920s.[58]

Similar to the housing law movement, zoning activism began out of an appreciation for the successes and dissatisfaction with the failures of

previous reform programs.[59] To this new generation of reformers, some of whose experiences came from architecture and landscape architecture but also included business interests, health reformers, labor activists, social workers, and others, the City Beautiful movement had failed to improve US cities.[60] Some pointed out that building a grand boulevard or a great civic center did not solve the problem of polluting industrial and factory districts pressed close to worker housing nor did the great City Beautiful plans adequately address the problems of congestion and overcrowding in downtowns.[61] Instead, they sometimes made conditions worse by funneling traffic onto a few major streets. The City Beautiful plans also proved physically and fiscally difficult to implement. Furthermore, demolishing housing to build new parks and boulevards was problematic when so many families lived in overcrowded conditions and there were few alternatives to house displaced persons. It was easier to develop plans than to implement them.

Central to the concerns of many urban planners at the beginning of the twentieth century was the problem of factories, slaughter houses, and other noxious land uses next to housing. While pollution was seen by some as a sign of progress, there was also a realization that factory noise and emissions made housing and industry incompatible next-door neighbors.[62] Even without understanding the health consequences of pollution, people with means chose not to live close to industrial districts.[63] Another key problem was that industry kept moving into residential districts, as there was no satisfactory mechanism to prevent factories from relocating to residential areas. So wealthy and middle-class houesholds were constantly at risk of finding themselves compelled to move to maintain their desired environmental conditions. Factories also threatened property values.[64] The better-off kept finding their expensive homes polluted, the poor lived too close to factories, and city governments found themselves unable to keep everyone and everything separate.[65]

Cities in 1900 had a limited set of means that they could use to regulate land use. Just as with early housing regulation, the main tool was the doctrine of nuisance.[66] In theory, a city could ban a land use because it was problematic for its neighbors. Similarly, a person could go to court to get a neighbor to stop doing something noxious if it interfered with the enjoyment of his or her own property. But there were problems associated with relying on nuisance laws to regulate land use. One was that it is reactive. A nuisance ordinance could not prevent a property owner from establishing a new business; the concept of nuisance could only be raised after a business affected its neighbors. The result was that problems were not prevented; they could only be addressed after they imposed on their neighbors. Furthermore, courts were reluctant to close businesses because

of the hardship this posed to owners. Also, poorer property owners often did not have the resources to pursue a court case, potentially causing them to put up with something that was injurious to their property, their tenants, or themselves. Another major problem was that tenants had no standing to bring a nuisance case; their only recourse was to move. Nor did the concept of nuisance provide any guidance on how to plan a city's future growth; it only looked back on what already existed. Finally, a given use might not have been a problem per se; it may have been an important economic activity, but was just in the wrong place, such as the problem of stables, which were necessary but difficult to live next to. Altogether, these problems suggested that nuisance law was not sufficient to allow a city to regulate land use and plan for its future.

Another tool that predates zoning was the restrictive covenant, prohibitions against certain activities placed in a property deed. These restrictions could be benign—no sale of alcoholic beverages or no manufacturing. Or they could be malicious: they were used to keep Jews and Blacks out of certain White Christian neighborhoods, a practice that didn't finally disappear until the 1960s.[67] Today, there are places where deed restrictions prohibit property owners from placing their laundry outside to dry and other similar small but sometimes onerous and unreasonable measures. Deed restrictions are the primary means of controlling land use in Houston, which is the only large city in the country without zoning. For the most part, however, covenants were not widely used and were not well suited for public control over land use. This was because the covenants were difficult to amend or enforce, government was not a party to their development and therefore could not use them to shape growth, and they could not be applied retroactively or implemented without consent of the current property owners. They were not the answer to either the land use control issues or the problem of separating factories from housing.[68]

None of these early tools for regulating land use could address the problem of density. As a result of the new technologies utilized by Louis Sullivan and others, the cores of many US cities were seeing increasing numbers of tall buildings. These raised concerns about access to sunlight and ventilation as well as traffic and congestion.[69] Thus unregulated development was affecting the health, environment, and quality of life of urban residents.

The Zoning Solution

The reformers had not found solutions to the problems of land use and development in the nuisance or abatement laws here in this country,

so they looked to Europe for better examples of public action.[70] The idea of zoning had originated in Germany in response to the problem of factories and housing being too close together.[71] That country had powerful land use laws in its cities and the government had broad powers to allocate land uses to particular districts. The separation of factories from housing was seen as a particularly advanced feature of the German effort, and Americans worked to develop similar laws to address the problems of proximity of factories and housing in the United States.[72]

An important person in the effort to use zoning to shape US cities was Benjamin Marsh (1877–1952), who helped to establish New York's zoning ordinance as well spread the idea of zoning across the United States. Like Veiller, he had spent a limited time as a social worker, and his concern for devising new laws to control development in cities arose out of his dissatisfaction with the congestion of New York's tenement districts. Marsh traveled extensively to study European land use laws and on his return, he published the benefits of the German zoning experience in newspaper articles and in books.[73]

The answer to the problems of congestion, density, and incompatible land uses, Marsh and others concluded, was zoning.[74] And with the development of zoning, the modern city planning profession was complete.[75] Ultimately, city planning emerged in the United States as a comprehensive endeavor, grafting the social justice goals of the tenement reformers onto the grand vision of the City Beautiful architects along with a concern for the health consequences of development.[76] In general, both groups shared a concern that the health of urban residents was at stake. The City Beautiful aesthetes saw their parks and grand spaces as providing opportunities for recreation, social benefits, moral uplifting, healthful living, and access to air and sunlight. The tenement reformers saw planning as a means to reduce urban densities, create more housing opportunities, and provide a chance to incorporate new ideas on health into housing. Both shared a common assumption that density was bad and that government needed to have the legal powers to prevent overdevelopment of land. Meanwhile, many developers and business interests liked zoning because it promoted business districts, helped protect land values, and allowed them make more reliable development decisions.[77]

Marsh saw zoning as just one piece of a comprehensive set of tools needed to reform cities and meet the challenges of the slums. He placed zoning alongside programs that would make cities healthier, more livable, and more efficient. In addition to zoning, he called for a coordinated program of city improvements: improving street construction; developing mass transit; careful siting of industrial lands; constructing railroads

and streets to serve factory districts; better siting of parks, playgrounds, and public buildings; reserving land for the construction of city services in developing areas (including if necessary, purchasing land for these purposes); and annexing land at the periphery of cities. These policies remain the hallmarks of well-planned cities and properly organized planning departments in cities today.[78]

In a move that was going to have important consequences for the rise of the obesity epidemic at the end of the century, as zoning developed, it included the assumption that cities were fundamentally unhealthy and that the best response to the problems of urbanization lay in making cities more like rural areas or low-density suburbs.[79] Marsh criticized the tenements and apartment buildings of the twentieth-century city and advocated for single-family homes as the way of reducing densities.[80] Marsh objected to the new high rises being constructed around Manhattan and worried that subway construction was creating overly dense residential districts. The new zoning activists were interested in decentralizing cities and they wanted to direct growth to the periphery or rural areas to reduce the crowding of tenements and the congestion of downtown areas by encouraging development in less dense portions of the city, such as had been done in Boston.[81] Marsh maintained that congestion cost money and caused disease.[82] So he used public concerns regarding overdevelopment and overcrowding to press his case for zoning controls. For example, in his speeches and public addresses, he predicted that Brooklyn would someday be home to six million people unless something was done to control density and development.[83] As will be seen in Chapter 10, by the end of the twentieth century, many researchers began to suspect that lower densities and strict separation of land uses were associated with reduced physical activity and higher risks of obesity. Thus the assumptions regarding health and the built environment of one era would be upended by the concerns of another (figure 4.2).

The merging of the social reform–based housing movement into a full city planning movement was spearheaded by Marsh and the Committee on Congestion of Population in New York, which had been founded by social workers and others in 1907. (Marsh was one of the committee's original five members.) Also on this original committee was Edward Bassett, a lawyer who would be central in drafting the first zoning laws. The committee met at a settlement house, Greenwich House, and it reflected some of the values of the settlement—social work movement. There could be no city planning, in the view of Marsh and his allies, without social justice.[84]

The first national city planning conference was held in 1909. The call for the conference had been growing for decades from social workers

Figure 4.2 Traffic in Detroit

concerned about immigration and the high densities of population in the tenement districts. At the same time, City Beautiful advocates had been working with business leaders, reform city administrations, and the public to apply the lessons of Haussmann's Paris and Chicago's White City to the industrial, tenement, and commercial districts that prevailed in most US cities. Thus their interests were at least momentarily aligned. But while the conference had participation from both City Beautiful advocates and workers from the settlement houses, there was tension between the two.[85] The social reformers sometimes challenged the City Beautiful movement, seeing it as elitist and unable to address the needs of the urban poor. In their opinion, the City Beautiful movement ignored housing in its concerns for the grand statement, promenade, and vista. Many City Beautiful advocates believed that many urban problems of the age were the result of deficiencies in the fundamental design of US cities and the lack of efficient street networks, the shortage of parks for the masses, and the absence in too many cities of a grand unifying vision. Interestingly, both sides shared the assumption that healthy housing and urban development should provide light and ventilation to its residents.[86] Thus Southwood Smith's theories still dominated the understanding of the health effects of the built environment. For example, Marsh called for zoning as a way to alleviate congestion and open buildings and streets to ventilation and sunlight.[87]

Just as there was a nativist bias in the development of the tenement laws, so was there an anti-immigrant undercurrent among many of the zoning activists.[88] Marsh also spoke out against migrants from rural portions of the United States spilling into cities.[89] There was also a movement to use zoning to reinforce the growing segregation of African Americans.[90] Almost as soon as the idea of zoning was brought to the United States, cities such as Baltimore tried to use it to zone districts for Blacks or Whites. These efforts were declared unconstitutional not because they infringed on the rights of African American people to live where they wished but because the courts found that race-based zoning interfered with the rights of property owners.[91]

The Triumph of Zoning

Zoning activists had followed the example of Veiller and the tenement law movement in that they created special commissions to publicize problems. They then followed up with legislation, first in New York, then with model laws that could be adopted by other states and cities. They worked for the passage of these new laws and for the appointment of special boards and commissions to administer them. Marsh had a role in the creation of the New York City Commission on Congestion of Population and the Heights of Buildings Commission, which began to study and develop potential solutions to the problem of too many people, too much street congestion, and overbuilding in Manhattan and elsewhere in New York City.[92] This work in turn led to the appointment of the board on the City Plan, again with Marsh as a closely involved participant. Finally, these organizations' studies and reports led to the zoning law of 1916.[93]

After World War I, zoning was quickly adopted by cities across the country and it soon came to be seen as a basic function of a well-run city, attracting the support of business communities.[94] Marsh helped this effort through his writings and speeches at the same time as Bassett was lending legal expertise to the new zoning movement, helping cities and states draft their own zoning ordinances. Under Herbert Hoover, then secretary of Commerce, the Advisory Committee on Zoning produced a model state zoning act in 1926 with Veiller and Bassett as members.[95] The model state zoning law was followed by a model city zoning ordinance. These steps are necessary because zoning is a municipal or county function, and because under the US Constitution municipal powers are creations of states, zoning requires a state-enabling act. So the model ordinance called on states to pass legislation allowing cities to establish acts.[96]

Zoning and Public Health

Public health concerns were crucial to the adoption of zoning. The implementation and spread of zoning across the country was greatly enhanced by a pivotal court decision, *Euclid v. Ambler*, decided in 1926. Euclid is a city on the edge of Cleveland and city officials, concerned about the spreading belt of industry along Lake Erie, wanted to keep their neighborhoods clean, healthy, and safe. So they turned to zoning, dividing the city into four types of zones with three types of height restrictions. Ambler Realty sued, claiming that the zoning prevented them from developing the industrial uses they believed they had the right to build and that the restriction represented a taking of their property rights without due process. The city claimed that the restrictions were necessary to protect the health and safety of other residents.[97] The Supreme Court sided with Euclid, holding that zoning was a reasonable use of a city's police powers and that because it was based on the protection of public health, it was valid and not arbitrary. Thus health concerns played a key role in the legal history of zoning, first prompting activists to settle on zoning as a way to separate unhealthy land uses from housing and then providing legal justification for this dramatic expansion in the right of government to control private property.[98] Encouraged by this ruling, zoning in this country became widespread. Standard zoning is often called Euclidean Zoning, not because of its geometric properties but because its legality was established in Euclid, Ohio.

Building Codes

The third great innovation to shape the built environment that arose during this era is the building code. The regulation of our built environment through codes is so pervasive that many people may not be aware that they exist. That stairs are always a certain height and depth, all of our light switches work a certain proscribed way, and we can walk into a hardware store anywhere in the country and buy functional and appropriate plumbing fixtures are at least in part the consequences of our uniform national codes. This did not happen by accident, but rather by the full force of almost every segment of society deciding to cooperate with the codes. As John Stilgoe, a historian of building codes, has noted:

> Almost any terrestrial, stationary built form outside the immediate control of electricity utilities and equipped with electricity beyond flashlights must be built according to the *Code*. To build otherwise is illegal, creates a public hazard, and creates something that cannot be insured [italics in original].[99]

Fire code history dates back to the great White City in Chicago in 1893. At the time, there was a rivalry between Thomas Edison's direct current system and George Westinghouse's alternating current. The issue was resolved when the insurance companies, after consulting with engineers, concluded that alternating current was safer. From that decision, alternating current became the standard not just for the Chicago Exposition but for every building in the United States today. This involvement of insurance companies in evaluating conditions of the built environment eventually led to the founding of the Underwriters Laboratory to test for fire and electrical safety.[100] The first national building code was introduced in 1905 by the National Board of Fire Underwriters. In the decades that followed, additional standard codes were introduced, and slowly they reached almost universal jurisdiction in the United States.[101]

The national codes were a great service to states and localities trying to regulate local conditions.[102] Cities and states could say that these national standards were based on the most scientific and technical research of the times. They were objective, and as time went by, the fact that courts in some jurisdictions upheld their objectivity and suitability meant that other courts would, too. This also facilitated the administrative and enforcement capabilities of local governments. Small jurisdictions, which could have never tested and written codes of their own, could buy standard manuals and send their inspectors to national conferences and training sessions. It also made them appear more modern and up to date in their work.[103]

While there were concerns that building codes would raise housing prices and make new housing even more beyond the means of low-income families to rent or buy, the codes were also developed and promoted as ways to reduce costs through standardization.[104] As will be seen, as part of the effort to revive the collapsed housing market in the Depression, federal legislation created the Federal Housing Administration (FHA).[105] The FHA, as part of its effort to facilitate mortgages and housing construction, created a set of standards that builders could follow and then rely on for their customers to get mortgages, though as will also be seen, these standards were responsible for racial discrimination and the deterioration of many urban neighborhoods as well.[106] The FHA standards, in conjunction with the spread of local building codes and zoning ordinances, had the laudable achievement of guaranteeing that virtually all the housing built in the United States after their development met the minimal safety and health goals of their time.

There were other reasons why reformers preferred to develop new national codes rather than working at the local level. Training workers becomes easier, and standard codes enable one contractor to have

the expertise to work in multiple jurisdictions. Based on the standard techniques outlined in the code, states could license contractors, which tradesmen often welcomed. There were also long-term advantages for the improvement of housing. Economies of scale could create the opportunity for further research. So the national push for standards became part of the agenda of progressive coalitions, and forward-thinking organizations, such as the American Public Health Association, became advocates for the development and adoption of uniform codes.[107] Local, state, and national business associations worked to get these standard codes adopted.

As noted in Chapter 2, fires were not just a health concern. Property owners feared the loss of their investments, families feared the loss of life and their worldly possessions, and cities feared for the impact on commerce and their tax bases.[108] So these diverse segments, led by the fire insurance industry, worked together to design and implement fire codes. Over time, fire codes became more robust with greater attention paid to the prevention of fires and the loss of life. While new code requirements can be met with opposition, in general they are adopted across the United States fairly quickly. These codes are ever more stringent. For example, sprinklers initially were only required in the tallest of buildings, those beyond the reach of ladders and hoses. Now many localities require sprinklers even in single-family houses.[109] A fire in the Station Night Club in Rhode Island in 2003 where 100 people died resulted in making it mandatory for bars and other gathering places, which were previously exempt because they were on the ground floor and in theory provided easy egress to their patrons, to have sprinkler requirements.[110] In similar ways, other important fire safety features are virtually universal in the United States, including enclosed stairwells, multiple means of egress, smoke detectors, and emergency lighting.

Urban Planning and Public Health Diverge

Given the successes enjoyed by the growing professions of public health and urban planning, it might have been the case that the connections between the two would have solidified over the first several decades of the twentieth century. But even as these new tools were developed and adopted across the country, the grand coalition of public health professionals and city planners, along with such allies such as social workers and civil engineers, began to dissolve as their professions moved in separate directions. The reasons for this separation are not well identified and most likely very complex.[111] City planners, in general, became more concerned with the traffic management, economic development policy, growth management, and other issues more distant from health.[112] Public

health began to focus on laboratory analysis, the transmission of disease from one individual to another, and the development of education programs, activities that did not include urban design and architecture.[113] As will be seen, the two groups would cooperate on proposals to create a public housing program and the implementation of urban renewal, but the process of separation had begun.

CHAPTER 5

BUILDING A SUBURBAN UTOPIA

INTRODUCTION

THIS CHAPTER BEGINS WITH AN OVERVIEW OF THE HISTORY of suburban development including a discussion of gridded versus ungridded development and how the shift from one to the other was to have health consequences. Next is a discussion of early twentieth-century suburbanization and how this led to the development of English new towns and garden suburbs in the United States. Then, the architectural theories of Frank Lloyd Wright are detailed along with his ideas on housing and suburban development. The chapter moves on to describe the successes of suburbia (its problems are presented inchapters 9 and 10) and concludes with a discussion of suburbs and race (table 5.1).

In the first decades of the twentieth century, in an effort that was parallel to and aligned with the work of urban reformers such as Lawrence Veiller and Benjamin Marsh, the United States accelerated its use of what would become one of its most prevalent forms of development: the suburb. As in cities, the suburban landscape had its own set of practitioners and theorists who in a reaction to then current urban conditions grounded their ideas of the proper design for residential neighborhoods in part on healthful living.[1] Later in the twentieth century, some critics were to charge that suburban development was purposeless and formless.[2] However, there were a comprehensive set of assumptions, values, and ideologies that shaped suburban development.[3] Consistent with Thomas Southwood Smith's idea that sunlight and ventilation were the primary factors promoting health, a complex set of urban design and architectural practices were to dominate the built environment in the United States until new theories were developed in the 1960s and beyond.

Table 5.1 Key dates in the development of a suburban utopia

Event	Years
Ebenezer Howard's Garden Cities of To-morrow	1898
Letchworth garden city opens	1903
Raymond Unwin's Town Planning in Practice	1909
Sunnyside Gardens opens	1924
Frank Lloyd Wright's Broadacre city	1931

SUBURBAN HISTORY

American suburbia did not begin in 1945 with the post–World War II housing boom. On the contrary, the movement to the periphery is almost as old as US cities themselves, and was in full force prior to the Civil War.[4] Suburbanization first began from a desire of the well-to-do to leave the congestion and filth of colonial cities. In the latter half of the nineteenth century, suburban form was given shape by American architects who were influenced by British rural and garden design, and implemented in a manner that also had continental influences.[5] In the twentieth century, the design of suburbia was nurtured by the inspiration of small, key projects and was finally given intellectual rigor by one of the most influential US architects of all time, Frank Lloyd Wright.[6] Thus the suburb has dense architectural and theoretical foundations. Through these emerging architectural conventions, the romanticism associated with rural gentrified living was combined with middle-class sensibilities created by the broad increase in prosperity made possible by the industrial revolution.[7]

In many older US cities, there are concentric rings of growth, each progressively less dense than before. For example, spreading out from what was at the time the central core of tenements, brew houses, small factories, and immigrants, Boston has its South End, built in the years 1850–1890. That neighborhood consists of brick (originally) single-family row houses often situated around small parks with their stables conveniently located several blocks away. Next came the Back Bay, built after 1890 in the French style—mansard roofs and a long central Beaux Arts promenade, the Commonwealth Avenue Mall. By the beginning of the twentieth century, development was pushing through Dorchester and Jamaica Plain. Here the housing consisted of wood-frame one-, two-, and three-family homes. Buildings were now detached, with sideyards designed to provide ventilation and sunlight to the working poor.[8] By the beginning of the twenty-first century, the Boston metropolitan area extended to Southern New Hampshire and Northeastern Connecticut in a typical suburban

milieu of capes, bungalows, and contemporary single-family homes on lots half an acre or more in size.

Similarly, New York is a march of progress up Manhattan, apartment building by apartment building, and then transitioning across Long Island and the mainland to an endless parade of single-family homes interspersed with occasional garden apartments. The upstate reach of the metropolitan area grasped Dutchess County in the 1990s and has now extended to the near corner of Pennsylvania. As distance increases, so do the lot sizes, and often, the houses themselves.

Even Los Angeles, often described as a post–World War II suburban experiment, is in reality a result of a movement of people and housing out from the old core that gradually filled in the Los Angeles basin in the prewar years before spilling over into the San Fernando Valley and Orange County in the decades after the war.[9] As the twentieth century ended, the metropolitan area spread out to Riverside and San Bernardino, and Los Angeles was almost ready to move over the Tehachapis to incorporate Bakersfield and the southern end of the San Joaquin Valley into its mass. As this metropolis spread, the houses became larger even if the lots did not. There were occasional low apartment buildings, often built around small courts, which were aimed at domestic and international immigrants. Over time, parts of Los Angeles begun to grow upward as well as outward.

Though rising incomes played a major role in the rise of the suburbanization process, in part, people with resources were pushed out of the center cities in the nineteenth century. Crime, immigration, disease, increasing economic activity, and the smells and disruption posed by industrialization made inner cities intolerable, particularly for middle- and upper-class native-born populations.[10] There were beggars, prostitutes, drunks, and other undesirables. There were the acrid smells coming from houses and businesses burning wood or coal for heat mingling with the emissions from steel plants, tanneries, cloth dyers, and all the other unregulated industrial processes of the day.[11] And no one had yet solved the problem of animal and human feces in the streets.[12]

Continuing from Southwood Smith's day, light and access to pure air were the health priorities—features often thought best achieved by single-family homes set back from neighbors and the street.[13] By twenty-first-century standards, the first suburban homes were often small and the distances from traffic and noxious land uses were too short, eventually contributing to a decline of many inner-city neighborhoods and what the Brookings Institute has called "first suburbs."[14] However, that suburbs are the locus of better health is part of the justification for people occupying single-family houses and the reason for people willing to endure extreme

commutes or stretch to pay enormous mortgages for the chance to own their own homes.[15]

THE GRID

There are alternative systems of categorizing suburban growth. One suburban architectural historian, Dolores Hayden, describes suburbs as having "seven vernacular patterns." In this classification schema, building in borderlands began about 1820. Picturesque enclaves started around 1850 and streetcar buildouts around 1870. Mail-order and self-built suburbs arrived in 1900. Mass-produced, urban-scale "sitcom" suburbs appeared around 1940. Edge nodes coalesced around 1960. Rural fringes intensified around 1980.[16] Each of these areas has a different typology of architectural styles, a different set of socioeconomic functions, and a unique place in the urban history of the United States. But from the perspective of twenty-first-century ideas concerning the built environment and health, there are perhaps two main types of suburbs: gridded, mostly built before 1975, and ungridded, predominating since that time.[17] While the very centers of Boston and New York City reflect European medieval cities, with curved streets and irregular passageways, the dominant feature of US cities up until recently was the grid.[18] Partly this was the result of the land surveys that laid out most of the United States west of the Appalachian Mountains as a regular punctuation of north-south and east-west lines perfectly adaptable to facilitate the distribution of land. But the grid predates the American Revolution, and new settlements from Savannah to Philadelphia to New Haven were carefully laid out as a series of right angles. The grid dates back to Roman military settlements and the laws that laid out cities in Spanish possessions in the New World.[19]

In addition to the way this helped promote development, the grid was adopted in part because it was thought to be healthful, allowing better circulation of traffic and the siting of each house on its own lot.[20] A regular system of east-west and north-south roads dominated city building in the nineteenth century and for much of the twentieth. Boston used a grid for the Back Bay and eventually, the grid was imposed on Manhattan development, broken only by Broadway and Central Park. Some of the illogic of such an ordered system is on view in San Francisco, where topography was ignored in service to the grid even when redevelopment was momentarily possible after the 1906 earthquake and fire.[21] Only New England and parts of the old South remained ungridded, though the grid made inroads in those areas as well.

The grid survived well into the twentieth century. Even Los Angeles, the archetype of mid-twentieth-century sprawl, is mostly a patchwork of

interrelated grids. West of downtown's grid, the Wilshire District's criss-cross streets blend into Beverly Hill's grid, which is adjacent to the lattice of West Los Angeles that then adjusts to Santa Monica's grid. Meanwhile, the Southland's famed freeway system is the grid on a large scale. Similarly, the grid that begins in Manhattan predominates all the way to Islip on Long Island and persists in older centers further east.

By the twentieth century, some urbanists, such as Lewis Mumford, had grown to oppose the grid as a way of laying out subdivisions and cities.[22] They saw the grid as increasing traffic and congestion because all streets were usable as shortcuts whenever traffic backed up on a major thoroughfare. In their opinion, too much land ended up being used by cars, and traffic occupied much of the area between housing. The solution, they thought, was to banish the grid and make superblocks (wide areas with no interior streets), orient houses away from the few streets that remained, and build either long curving streets or cul-de-sacs, streets that end without a way out. The ungrid (often called a dendritic street design) also has a long history. It was codified by Sir Raymond Unwin, an influential English urban planner, and others around 1900, and steadily rose to dominate suburban norms.[23] Building on Unwin's ideas, mid-twentieth-century environmentalists such as Ian McHarg saw grids as being disruptive to the natural landscape and a symbol of the dislocation of humanity from nature. To reconnect urban dwellers to nature, McHarg, went back to ecology theory, using it to address the built environment as an ecosystem, a totality that includes all aspects of human living.[24] McHarg provided an ecologic ideological rationale for abandoning the grid. Thus, eliminating the grid was partly the result of values and assumptions that saw cities as antinature and destructive to the natural environment. At some point in the 1970s, the old grid system fell out of use in most suburban development.[25]

The now dominant form is the conventional US suburban pattern such as dendritic hierarchies of street types like the blood vessels in the body: highways, arterials, collector streets, and cul-de-sacs.[26] Contrast the 1960s urban fabric of Los Angeles's San Fernando Valley with the 1990s street pattern of Sugarland, Texas, or Cobb County, Georgia. In that part of Southern California, most streets run east-west and north-south and there tend to be multiple connections between any two points. In Texan and Georgian newer suburbs, there are occasional, almost accidental mini-grids in an individual subdivision, but the overall structure is one of large, long arterials feeding into a highway system. From the air, there are the lollipops of the cul-de-sacs, leading into other streets that feed only into the arterials, not into each other. No interaction between neighborhoods, or within most neighborhoods, is possible.[27]

Twenty-first-century health research suggests that one of the chief benefits of the grid is that it allows for greater street connectivity and therefore encourages pedestrian movement.[28] The grid also promotes physical activity and discourages driving because it slows traffic on any individual street. To live in a nongridded suburban development is to be almost totally dependent on the automobile: every trip must be made by car because all destinations become too distant by foot or bicycle.[29] Even a destination that might be close as measured by its straight line distance becomes impossible to walk to because of extraneous turns and numerous busy arterials that are too dangerous for walking.[30]

An argument against the grid is that it is easier for children to play outdoors in the serenity of the traffic-less cul-de-sac, and since no outsiders would ever venture into these dead ends, any potential criminal is easy to spot. These advocates maintain that cul-de-sacs are safer from crime.[31] But by the age of ten, many children are enrolled in organized activities, and as for younger children in most parts of twenty-first-century America, parents who can afford it do not let their children play outside alone as the perceived danger of abductions by strangers is too great.[32] Recently there has been a movement back to constructing gridded suburbs for other safety concerns. The limited number of entry points can make it difficult for police and fire authorities to reach houses in cul-de-sac neighborhoods.[33] Some traffic engineers now believe that the design of the cul-de-sac leading to collector street leading to arterial system actually increases traffic because it necessitates more trips and concentrates cars on a small number of overburdened arterials.[34] If current health concerns about dendritic street patterns become more widespread, perhaps there will be a greater movement to return to the grid.[35]

Early Effects of Suburbanization

At first, this great exodus to the periphery was generally unnoticed inside urban cores, at least in part because many of the new suburbs were built inside center cities' corporate limits. City taxes and did not decline and there were enough new immigrants to keep the overall population growing.[36] As will be seen, it was not until immigration was slowed by World War I and restricted by new laws in the 1920s that portions of some US cities began to lose population.

But regardless of how suburbanization affected cities later in the twentieth century, the wave of peripheral growth in the 100 years prior to 1950 contributed to positive health effects.[37] A portion of many of the health improvements seen in the general population in the twentieth century can be attributed in part to the healthful conditions in the new

suburbs. Overall tuberculosis rates began to decline because of the population shift to the new, more ventilated neighborhoods, as well as through an increase in the health of wealthier native-born populations and the implementation of Lawrence Veiller's housing laws.[38] Many of these new neighborhoods had small, pedestrian-friendly commercial districts along arterial routes or accessible to neighborhood residents, also facilitating healthy lifestyles.[39]

THE GARDEN CITY

Some late nineteenth-century urban reformers had mixed views of the suburbs.[40] In their opinion, while there were advantages resulting from access to sunlight and ventilation, many of the early suburbs were ill-planned and if there were some exceptionally beautiful communities, many were seen as less exemplary with block after block of identical housing, a worker population forced to commute long distances, and little resulting improvement in the moral health of the community.[41] In reaction to what was seen as blandness and more of the same ills that afflicted the inner core, along with an increasing concern that something was needed to improve the housing conditions of the working poor, a movement grew up that conceptualized a new way of building communities.[42]

As London was one of the first metropolises to experience the large growth of streetcar and railroad suburbs, by the end of the nineteenth century it was also the location of one of the first suburban planning movements: the Garden City. The idea was popularized by Ebenezer Howard (1850–1928), a newspaper reporter who had lived in both the United States and England.[43] His idea, still appealing in the abstract but rarely implemented in full, was to build entire new self-sustained communities at a distance, but not too far, from the city. Inspired by Frederick Law Olmstead's and others' ideas about landscape design, Howard sought to reconnect urban working-class families with the potential of the countryside. In addition, he wanted these communities to be big enough to have their own services, including cultural and other facilities as well as manufacturing. Recognizing that there were attributes that could be found only in London, individual garden cities were to be connected with the center city and with each other by railroads. He envisioned a whole constellation of these small centers, each separated by a greenbelt and most of them self-sufficient economically and socially.[44] The garden city was to contain about 30,000 people on about three square miles of land.[45]

There was an important health component to Howard's plans. The siting of housing and manufacturing was carefully considered. The construction of dwelling units should maximize sunlight and ventilation, and

there were to be ample playing fields and other opportunities for physical activity and exposure to clean air.[46] Housing was to be within walking distance from factories, but far enough so that the environmental impacts were minimized. The moral benefits of the new communities were also stressed. What the temperate Howard did not plan for were pubs and alcohol—there was still a strong connection between moral and physical health.[47] Workers in their new suburban single-family homes would be kept from both radicalism and the moral degeneration of the assembly line.[48]

After great difficulty, for Howard was not an affluent man, he succeeded in finding wealthy backers for his new town, William Lever and George Cadbury, whose fortunes rested on soap and chocolate, respectively.[49] With their assistance, he created London's first garden city, Letchworth, in 1903. This was followed by Welwyn Garden City in 1920. For the most part, the financing of new towns was a problem until the government took the lead, which successive British administrations were to do for decades. Perhaps stung by criticism that a garden city is uneconomical and cannot work without large public subsidies, Howard devotes six chapters of his book *Garden Cities of To-morrow* to the finances and administration of his city.

Sir Raymond Unwin was the architect for Letchworth. Based on his experience there and elsewhere, he wrote one of the first design books on suburban town planning, specifying street width (with a hierarchy of widths), the orientation of houses toward the street, and the ways these new suburban towns were to relate to the center city. In all these efforts, he continues to follow health guidelines consistent with those laid down by Southwood Smith. Unwin also took guidance from Olmsted and he advocated for clustering development and creating large open spaces.[50]

By the standards of today, many of these developments are healthy.[51] They provide open space, well laid out housing units, and accessibility to shops and employment. They are at least as affordable as their suburban competition. There are over two dozen garden cities around London and their development patterns tend to reflect the influential planning ideologies of the time of their development: some are of traditional design, and some tend to be more reflective of Modernist ideals or postwar suburban values. Overall, while they tend to be commuter suburbs, most are at least marginally successful in terms of housing prices and occupancy (more for the middle class than the poor).

Another important advancement in theory at this time was the idea of the neighborhood unit, put forward by Clarence Perry and others.[52] The theory suggests that in a well-designed community, every neighborhood should be relatively self-contained with access to education, employment,

shopping, and other amenities. The neighborhood unit idea helped shape many of the community design plans proposed in the first half of the twentieth century and were a leading influence on the American Public Health Association's neighborhood guidelines discussed in Chapter 7.[53] The idea became attenuated during the era of overly strict separation of land uses along with heavy reliance on automobiles after World War II. But it was to return to prominence by its adoption by new urbanists and public health advocates toward the end of the century.[54]

American Garden Suburbs

In America, the Garden City movement inspired the development of "new towns," comprehensively planned, large-scale, suburban areas. One of the first developments that could be considered a new town in the United States was Forest Hills Gardens in Queens, New York, laid out by Frederick Law Olmsted, Junior. Later, Sunnyside Gardens, also in Queens, opened in 1924 using a grid pattern, but it arranged its apartment blocks around large open greenspaces.[55] These projects demonstrated the possibilities of town planning to Americans and sparked new interest in garden cities in the United States.[56]

Another effort opened in 1929. Radburn, New Jersey, was not a true garden city; it was not surrounded by any sort of greenbelt, nor did it have any industry or other employment opportunities. But it did provide numerous cul-de-sacs off of broad curving avenues, essentially consisting of superblocks. Radburn grew out of a desire to house people of all income levels, but it quickly became apparent very early in the planning process that there would be no place for the poor or working class in this suburban utopia.[57] Even then, the development ran into financial troubles after the stock market crashed.

Confronted by the Great Depression, President Roosevelt was perhaps more concerned with putting the unemployed back to work than with new town planning, though his programs included a large amount of infrastructure construction that would contribute to health and safety. In addition, as we will discuss in Chapter 7, the Depression marked the beginning of the federal government involvement in housing. And the federal government provided for the construction of a few model suburbs, including Greenbelt, Maryland. One of the purposes for building Greenbelt was to provide housing that enhanced healthy living.

For the most part, rather than large-scale new town development, US suburbanization has been the result of continuous development of small- to mid-scale subdivisions with few large new suburbs constructed based on any innovative master plan.[58] This does not mean that there have

not been large new settlements of tens of thousands of new homes along with accompanying commercial, and sometimes office, development. It is just that generally, these developments have tended to be conventional, indistinguishable from their neighbors and lacking in innovation.[59] Some of the later new towns, including Reston, Virginia, and Irvine, California, are important economic and residential communities, but they have been less successful in influencing suburban design.[60]

Frank Lloyd Wright and Suburban Form

Though many people contributed to the development of the American suburb, Frank Lloyd Wright (1867–1959) had a major influence on both suburban housing and neighborhood design.[61] He is important to this narrative because of his contributions to suburban theory and Modernist architecture ideas. The turmoil of Wright's personal life might have overshadowed the abilities of a lesser person.[62] However, the scandals did not stop Wright from continuing to infuse a moral basis into the rationale for his designs, though they may have contributed to his eclipse from popular influence during the middle years of his career.[63] Others, particularly Unwin and Perry, influenced him in thinking of the design of the ideal suburb but Wright gave it clarity of form and rooted it in the American landscape tradition dating back to Thomas Jefferson.[64] He was not the first to conjure up affordable single-family homes for the masses, but Wright consciously used modern materials, and his designs were infused with volumes of space and articulation of windows that seem contemporary to us—only the scale has increased.[65] Over 50 years after his death, his influences can be seen in US suburbs from coast to coast. And as US ideas provide models of living for the wealthy in other countries, his legacy is global.[66]

Wright was born in rural Wisconsin and reached maturity as the US frontier era was coming to a close; there is an antiurban bias in his work.[67] Most of his design work was created in secluded rural retreats: Taliesin in Wisconsin, and later, Taliesin West in Arizona. Wright was once offered a job by Louis Sullivan but he turned it down. Later he was to write of the architecture created by his would-be mentor:

> Nonsense is talked by our big skyscraperites in the blind alley they have set up, defending urban congestion by obscuring the simple facts of the issue. Of what use, in modern light, is the surgery of these superspace-makers for rent-professional promoters of the congestion-promoting traffic problem? Their skyscraper-by-skyscraper is the dead wall of our obstruction, the gravestone of capitalistic centralization.[68]

He championed rural and suburban living in his home life, in the main body of his work, and in his detailed theories of architecture and town planning.[69] There are many influences on Wright's work and theories. One can see both Paul Cezanne's Impressionism and Pablo Picasso's analytic cubism in Wright's careful articulation of building planes and masses. For example, one assessment of his architecture was to conclude, "In Wright's Robie House, as in Picasso's contemporary portraits, the conventional image of house (or person) is broken down into a series of intersecting, overlapping and nearly autonomous planes."[70] Wright acknowledged his debt to Japanese woodblock prints, he was an avid collector—often clinging to his collection even as creditors were knocking on his door, and their flattened perspectives and intermingling of the natural and the human-made shape his designs.[71] Throughout his work one can detect the influence of the American Midwest with its limitless horizons and vast quantities of flat land. There is his antiurbanity: his dislike of traffic, noise, and the congestion of cities, and his distaste for many of the aspects of modern life such as banks, schools, and factories.[72] As we will see in the next chapter, his relationship with Le Corbusier and Modernism, major rivals to his influence over architectural styles of the twentieth century, is complex.[73] The first half of Wright's career, with his organic forms and his consciously stated rejection of the past, helped energize the Modernists. Wright's later work, in turn, is clearly influenced by European Modernists and when the architecture critic Vincent Scully places a photograph of Wright's Fallingwater House opposite Modernist Rudolf Schindler's Lovell Beach House, the similarities are undeniable—the two had worked together at one time.[74] Both houses have expansive horizontal concrete forms, impenetrable glass panels, and a significant rooting to their sites. Yet Le Corbusier and Wright maintained their differences and publicly rejected each other's ideas. Wright even disliked the term "international style," the alternative name for Modernism.[75] Perhaps these differences are best laid to the friction inherent to two very intelligent and opinionated personalities.

Wright's Prairie Style and Usonian houses represent his effort to produce well-designed, affordable housing for the masses.[76] The origin of the word "Usonian" is unclear, though it is thought to be related to the term "USA." These houses are aligned with the street, yet isolated from it, with few windows visible to passersby. They are built to conform to an underlying grid (a building based grid, not the street grid), though the grid can change from orthogonal to hexagonal (in the case of Hanna House at Stanford, California) from house to house. Most modern about Wright's houses is their dramatic interior space—a feature that moves them closer to the twenty-first century than the nineteenth century.[77]

Wright was quite explicit about his focus on volume and wrote, "The reality of the building is not in the four walls and roof but in the space enclosed by them to be lived in."[78] Wright's interiors could soar and people could move from room to room in a free and uninhibited fashion. Wright houses, and those built after Wright's ideas came to dominant US domestic architecture, are voluminous. Wright wanted to keep costs low through standardization of building parts; and in his plans for his houses he thought that a master craftsman working onsite could easily engineer and massproduce many of the materials that would otherwise take careful craftsmanship and individualization.[79]

Unfortunately, economic conditions meant that the working classes who were supposed to be the clients for Usonian houses were unable to commission them. However, the Usonian ideal spread across American suburbia.[80] Perhaps the main changes from Wright's plans are the expansion of the front lawn and the growth in the size of garages. As will be discussed below, Wright thought that families will self-sufficiently grow their own food, but this never happened. Instead, the large elaborate frontyard of American suburbia developed. Also, because of the lack of accessibility, households need more cars, so the garages grow ever larger.

BROADACRE CITY

Wright designed and theorized about ideal communities as well as individual buildings. As the Great Depression deepened in 1931, Wright proposed Broadacre City, a utopian suburban development that combined the already decades old idea of English garden cities with his advancing ideas regarding architecture and community.[81] In designing this community of single-family homes on one acre lots, Wright's antiurban bias became clear. In 1938, he published a monograph outlining the ideology underlying his suburban vision:

> Centralization, whether expressed as the city, the factory, the school or the farm, now has the enormous power of the machine-age setting dead against it. It is to the nature of universal or ubiquitous mobilization that the city spreads our far away and thin.[82]

Wright wanted to get rid of the traditional grid of American cities and replace it with a hierarchy of collector and arterial roads.[83] Each house was to be self-sufficient in food and workspace. However, an acre of land is not sufficient to feed a family. Regardless, the large yards were to be cultivated and provide critical air, light, and recreation space—again the health ideas of Southwood Smith were repeated in a new architectural idiom. To solve

the problem of traffic and congestion of city living, Wright envisioned cars and helicopter-like devices to transport people. Even teenage delinquency and unemployment were to be eliminated through the employment of youth in the family gardens.[84] Purchased goods were to be available at gas stations situated along exits to the grand highways that were to tie together his far-flung communities. Any other services were to be concentrated in cultural or other centers.

The problem, we know now, is that while the lighting and ventilation of the Usonian house on the Broadacre lot might limit exposures to pathogens, the resulting traffic and congestion create air pollution and stress, and the physical layout of the community discourages physical activity.[85] The houses were divorced from the life of the street and ultimately would insulate their occupants from any connection with their neighbors or society.[86] Because Wright's economic utopia did not arrive along with his physical layouts, the inhabitants were forced to spend hours traveling in pursuit of economic opportunities, cultural enlivenment, and even basic foodstuffs.[87] Rather than a new society of independent yeoman farmers, each self-sufficient and living in harmony with nature while spread thinly across the landscape, Broadacre City in practice fosters a dependence on cars, uses large amounts of land, and situates families at a distance from food and consumer goods.[88]

But if we blame Wright and the other planners and visionaries of this era for the problems of contemporary suburbia, we must also credit them for its successes. There is the debatable proposition that suburbs are intellectually sterile and deadening to the human spirit. Perhaps more testable, suburbs might be resource intensive and may make people sedentary and obese.[89] But they are homes to millions of generally happy people who delight in their privacy and personal functionality. A majority of the US middle and upper classes are products of the suburbs and to the extent that these people are healthy and productive, we must add them to the ledger of successes.[90]

Suburbs and Race

For almost 25 years, roughly from the ending of wartime restrictions after 1945 to the beginnings of the 1970s great inflation and energy crisis, for many, if not most of their residents, US suburbs were highly desirable.[91] There were critics from the beginning. Mid-twentieth-century urbanists such as Lewis Mumford and Jane Jacobs were concerned by the endless stretch of single-family homes, often identical, which spread across the landscape. But a large number of Americans, internalizing the lessons of the nineteenth-century city, had decided to move to the suburbs.[92]

By moving to the suburbs, many parents thought they could guarantee a healthier place for their children with abundant sunshine, fresh air, and multiple places to play.[93] Rather than crossing dangerous streets, children could walk to nearby schools.[94]

We will discuss the health and environmental problems of suburbia in chapters 9 and 10, but one major issue must be mentioned here. One of the principle objections to the suburbs from the 1950s to the present has been their racial exclusivity.[95] The past two decades have seen increasing diversity in some US suburban areas, but for the most part, people of color continue to be largely housed in inner cities. This is a legacy of a history of racial bias in real estate. There were low-term government-backed mortgages, but only if borrowers were White, a discriminatory situation that was only overturn by new laws in the 1960s. Racial covenants, exclusionary zoning, the threat of violence, and other overt and covert acts of discrimination kept Blacks trapped in the decaying older neighborhoods for much of the twentieth century.[96] There have been numerous attempts to link urban sprawl and racial segregation. The logic of the connection seems insurmountable: Whites to the suburbs, increasing sprawl; Blacks stay in the city, increasing segregation.[97] But efforts to prove the association have been unsuccessful. The most segregated metropolitan areas include highly sprawled areas such as Atlanta, and highly compact areas such as New York City. The best explanation for this seemingly illogical lack of association is that both sprawl and segregation are multidimensional concepts.[98] Some aspects may be related, others are perhaps antagonistic, and some are just independent of each other. But in any case, suburbs represent a lost opportunity. In a highly racialized landscape where any movement into an existing White community by Blacks was met by violence, suburban communities were virgin race-neutral territories, unclaimed by any existing group.[99] They could have been a place where Blacks and Whites lived as harmonious neighbors. The reality was that the racial politics of many of the new suburbs, for at least most of the twentieth century, were as regressive as that of old neighborhoods.[100]

CHAPTER 6

MODERNISM AND THE SCIENTIFIC CONSTRUCTION OF THE BUILT ENVIRONMENT

THIS CHAPTER IS AN OVERVIEW OF ONE OF THE MOST INFLUENTIAL architectural design trends of the twentieth century: Modernism. It begins with a discussion of some of the contradictions of Modernism, the gap between its lofty goals and sometimes less successful reality. Then the story is told of its beginnings in Europe and ideas developed by Le Corbusier, the Bauhaus School, and others. This is followed by a detailing of Modernism's health goals and use of new building technologies. Next Le Corbusier's Radiant City design is discussed. Then the triumph of Modernism, first in Europe and elsewhere and eventually the United States, is outlined. The chapter then turns to the problems of Modernism and the reaction against it. The next sections discuss Modernist housing and city building styles, including some of its important legacies. The chapter concludes with an assessment of Modernism's health, sustainability, and equity impacts (table 6.1).

THE CONTRADICTIONS OF MODERNIST DESIGNS

As will be discussed in this chapter, Modernism, or the International Style, was a major twentieth-century architectural movement and was part of the guiding ideology for much of public housing, urban renewal, and city building in the United States from World War II up to the 1980s. Keep in mind that the discussion in this book is not concerned with the aesthetic strengths or weaknesses of Modernism; its austere use of concrete,

Table 6.1 Key dates in the development of Modernism

Event	Years
The magazine de Stijl founded	1917
The Bauhaus opens in Dessau	1919
Le Corbusier proposes Plan Voisin	1925
International Style exhibit opens in New York	1932
CIAM Athens Charter	1933
Pruitt Igoe housing development opens	1955
Seagram Building opens	1956

glass, and steel will appeal to some while others may find it off-putting. Rather, the health aspects of Modernism that are highlighted here. Modernism featured the orientation of buildings away from streets, the use of superblocks, the ideal of the skyscraper in the park, and other features that are now thought to negatively impact walkability, and increase crime and other health issues. In addition, it is the very way that scientific ideas of the time regarding health were incorporated into Modernist design principles that make the story of Modernism relevant. Modernism may be the most explicitly health-conscious architectural movement before our current time. Therefore, to the extent we are in a second wave of merging health ideas into urban design, the lessons of Modernism should be carefully considered.

Modernism had complex roots but incorporated a strong desire to improve the social, health, and environmental conditions of cities and Modernist architects tried to incorporate scientific theory of its time to meet these challenges. As Christopher Wilk, curator of the 2006 retrospective on Modernism at London's Victoria and Albert Museum, wrote:

> However naive we find the utopianism of the years after the First World War, it is crucial to remember that Modernists sincerely and passionately believed that design based on the ideas and technologies of modern industrialization could solve the pressing problems of the day.[1]

Its proponents claimed they had learned the lessons posed by the nineteenth-century city and promised they could eliminate poverty, disease, and moral problems.[2] They believed they could reunite art and science, bring good design principles to the masses, and incorporate abstract aesthetic theory into common architecture.[3]

There are many beautiful legacies of this architectural movement. For example, the monumental repetition of concrete elements of the Salk

Institute in La Jolla, California, designed by Louis Kahn, communicates the potential ability of humanity to simultaneously live in harmony with nature and assert dominance over it, just as Jonas Salk used the power of biology and the human immune system to develop a vaccine against polio.[4] Similarly, there is the intellectual excitement of the Seagram Building (designed by Ludwig Mies van der Rohe in collaboration with Phillip Johnson) in New York City that uses dark glass and repetitive horizontal elements to assert the ideology of the power of US capitalism at a time when it appeared that only that economic form could guarantee a livable future.[5]

But as sometimes implemented in practice, and in combination with other problematic urban design initiatives, there are also less successful designs, degraded buildings, and bland developments.[6] The lonely open spaces of the State Office Complex in Albany, New York, are detached from the life of that city.[7] Nothing in Los Angeles's Century City suggests it is part of that multicultural, media-intensive city.[8] When in New York City, it may be difficult to walk along Avenue of the Americas between 40th and 50th streets (near Rockefeller Center), with block after block of drab glass towers fronting on dark concrete plazas, and not become concerned with Modernism's impact on city vitality.[9] To a certain extent, twentieth-century architecture's failure to improve US cities is Modernism's failure.[10]

Modernist buildings tend to be built of concrete, steel, and glass.[11] They generally shun ornamentation but are allowed to emphasize repeated geometric elements such as a large facade completely covered by identical windows. The ideal Modern building is oriented to the sun even if that means it avoids the street.[12] In fact, streets, with their traffic and noise, are often ignored entirely.

Beginnings

Modernism developed in Central Europe in the first decades of the twentieth century but ideologically, it could be traced further back to the rebellion of the Impressionists against the Academy.[13] Prior to the Impressionists' new way of thinking and looking at nature, Classicism was a major mode of artistic expression.[14] For example, architects wishing to rebuild European cities in the classical mode sometimes turned to books such as *De Architectura,* written by the Roman ancient Vitruvius to guide their designs.[15]

Classicism as an architectural style was being challenged in Europe at the beginning of the World War I because of boredom, overuse, and its association with imperialism and empire.[16] For example, Beaux Arts

Brussels was called the "sepulcher white city" by Joseph Conrad in his novel *Heart of Darkness.*[17] But Classicism was ultimately intellectually deposed as the dominant architectural style of Europe because of the horrors of World War I when Europe's governments and ruling classes were blamed for trench warfare, machine guns and gas attacks, and the needless deaths of millions of young men. For example, De Stijl, the influential and revolutionary group of Dutch architects and designers, declared, "The war is destroying the old world with its content."[18] Because the establishment's architectural style of choice was Classicism, forward-thinking architects began to reject its dominating aesthetic along with its symbols and artistic vocabulary.[19] In the context of these rapidly shifting set of values, perhaps any new style had a chance to become popular, at least with the radical *advant garde.*[20]

Among architects who had adopted a goal of furthering social justice in the decades of the twentieth century, there was also a feeling that Classicism, with its primary attention on monuments, public buildings, and mansions of the wealthy, had failed to address the problem of housing for the growing urban working classes. For example, Wilk notes, "Modernism's social agenda—one of its defining elements—was a direct response to the interrelated problems of poor health and poor housing affecting large segments of the population."[21] Because it ignored workers who were living in conditions that were far from meeting Southwood Smith's health standards, supported the imperialist designs of the dying monarchies of Europe, and reminded many of a past that seemed ill equipped to face the challenges of the new machine age, many radicalized architects declared that Classicism had to be rejected. For example, Antonio Sant'Elia, in his *Futurist Manifesto*, an influential text, proclaimed, "I oppose and despise . . . all classical, solemn, hieratic, theatrical, decorative, monumental, frivolous, pleasing architecture."[22] The end of World War I was a time of intellectual ferment in all the arts. Perhaps feeling this spirit, progressive architects declared that art, combined with new scientific knowledge, would serve to bring in a new order dedicated to helping the poor and those at the bottom of the social scale.[23]

Tim Benton, the art historian, notes that there were two powerful assumptions guiding the Modernist effort to modify the built environment. One was that the built environment was a legitimate tool to modify human behavior. The other was that the utilitarian goals of buildings were more important than aesthetic ideals.[24] As will be seen, the Modernists proposed that technology could solve the social and built environment problems of the day and that cities and housing could be engineered to be more efficient.

Frank Lloyd Wright was also one of the inspirations for the new Modernism. Facing fading prospects in the United States because of personal scandals and the Beaux Arts architectural dominance of the White City, Wright traveled through Europe and mounted a major exposition in Germany in 1910 that contributed to the development of Modernism.[25]

In rejecting Classicism and the Beaux Arts love of detailing, the Modernists were building on a preference for austerity.[26] They believed that simple living, shorn of the debased ornamentation of classicism, would promote a healthy moral culture. In this aesthetic, the crisp clean white planes of the Modernists represented spiritual purity.[27] To uplift the morals of the working class, it was thought that they should be made to live in morally pristine buildings, hence the reliance on grays, whites, black, and primary colors.

Le Corbusier

Modernism, therefore, was an idea that had many beginnings, but Le Corbusier (1887–1965) is one of the philosophical patriarchs of the Modernist style of city building. Born Charles-Edouard Jeanneret-Gris in Switzerland, he could have ended up a watchmaker, as did most of the people who lived in his native town. Instead, he brought his meticulous and detailed intellect to the study of architecture.[28] Le Corbusier moved to Paris; published a number of books on architecture and city planning; helped organize an international association of Modern architects; and designed influential buildings in Europe, Asia, and the United States.

The Bauhaus

Le Corbusier was not alone in promoting Modernism. There were the Dutch architects such as Jacobus Oud and Willem Dudok; and Theo van Doesburg edited the magazine *De Stijl* from 1917 to 1931 through which he popularized Modernist values as much as did the writings and lectures of Le Corbusier.[29] There were also Germans and Austrians who contributed to the early development of Modernism just before and after World War I.[30] Also very important, in 1919 Walter Gropius founded the Bauhaus to train students in Modern arts and design.[31] In its 14-year nomadic existence (it moved from Desau to Weimer to Berlin), the Bauhaus served to crystallize the growing threads of Modernism and when the school was closed and the faculty dispersed under pressure from the growing Nazi threat, the design ideas of the Bauhaus helped make Modernism the International Style. The school attracted some of the most celebrated architects and artists of its time including Anni and

Josef Albers, Ludwig Mies van der Rohe, Lazlo Moholy-Nagy, Wassily Kandinsky, and Marcel Breuer.[32]

HEALTH AND MODERNIST ARCHITECTURE

Modernist architects strongly believed in the power of the written word and many of its practitioners wrote manifestos documenting the intellectual underpinnings of their works. In these statements, we read that Modernism was based on promoting health; providing affordable dwellings for the masses; and reconnecting man, the machine, and nature.[33] As a group, these Modern architects strived to address the health, social, and design problems of the city. Thus the Modern movement was a combination of the romantic and the utopian, as well as realist.[34] It purposely rejected the past and placed science ahead of emotion as it used a new set of values and assumptions to guide its ideologies and designs.[35]

In general, the parameters of the Modern building were rooted in health beliefs that were consistent with the ideas of Southwood Smith. For example, one important Modernist text was to proclaim, "The key functions, housing, work, and recreation develop inside built volumes subject to three imperious necessities: sufficient space, sun, ventilation."[36] Entire projects were dismissed if it was felt that they did not property align themselves with the sun.[37] As Southwood Smith would have suggested, Modernist architects thought that improved ventilation would stop the scourge of respiratory infections. The new plumbing features would rid the working classes of problems of enteric diseases.[38] And by making the housing cheap enough that children would no longer have to sleep in beds and bedrooms with their parents, Modernism believed they could eliminate the moral diseases of the poor as well.[39]

BUILDING TECHNOLOGY

Modernists worked to harness the power of the industrial revolution that had transformed lives through its ability to produce cheap, high-quality, consumer goods.[40] Thus the factory, even though it was also seen as the great dehumanizer of the industrial revolution, inspired architects to examine how housing was designed and produced. The theory of the socioeconomic construct of the factory, called Fordism, is derived from Henry Ford and the rise of the American auto industry.[41] The Fordist means of production depended on large numbers of semiskilled workers arranged in long production lines with continent or worldwide distribution networks. By harnessing the repetitive motions of thousands of workers and the capital created by millions of pooled investments, the

auto companies built highly engineered cars affordable to the masses. By applying the principles of Fordism to urban housing, the Modern architects thought they could provide the economic means of building affordable, well-designed housing. If the factories were producing cars and consumer goods cheaper and of higher quality than the old craftsman system, why not apply their techniques to housing?[42]

Similarly, the Modernists were influenced by the theories of Frederick Winslow Taylor, the American mechanical engineer and efficiency expert. Taylorism held out the promise that human activity could be studied, and by breaking down tasks into subroutines, could be made more efficient. Taylor based his work on his observations of the factory floor. The Modernists applied his theories to examine the design of apartments, neighborhoods, and cities.[43] The layouts of kitchens were analyzed to reduce the steps needed to cook meals, the relationship of bathrooms, bedrooms and communal areas were assessed to minimize noise; and buildings themselves were oriented so as to maximize sunlight. The scientific rationality of Fordism and Taylorism convinced the Modernists that cities could be built for speed and houses could be perfected as machines for living.[44]

To achieve affordability, attention was paid to the mechanization of the production of building materials. Part of this came from the US experience with balloon architecture and the theories of Frank Lloyd Wright. But as industrialization spread from its centers in England and France to the most distant corners of the continent, so did the idea that massproduction could substantially reduce the cost of providing safe, healthy housings.[45]

Le Corbusier also took advantage of new technologies to radically alter the structure of buildings.[46] As noted in Chapter 3, up to the time of Louis Sullivan and the Chicago skyscraper architects, buildings needed heavy walls to support floors and roofs. Earlier Gothic architecture sought to get around this limitation by using flying buttresses that allowed cathedrals to be built. But for city apartment and office buildings, these stone arches were too expensive and took up too much space.[47] The heavy masonry wall dominated building technology and severely limited options for opening up facades. These brick or stone buildings, constructed on narrow deep lots along narrow streets, created gloomy, unventilated interiors. The darkness was not only unhealthy; to the Modernists, it appeared to stifle the possibilities of human creativity.[48]

As Sullivan and his associates suggested, the answer to this problem was steel framing and for the first time in architectural history, buildings could be supported by an interior skeleton and walls could be reduced to thin plates of glass.[49] The early skyscraper architects took advantage of the

load-bearing properties of steel frames to lighten their facades, but many still tended to be heavily clad in terra cotta, stone, and brick. To picture this, consider the Chrysler and Empire State Buildings: both have massive-looking facades with relatively small windows. But Le Corbusier realized that even terra cotta or stone veneers were unnecessary and could be replaced by glass.[50] So inspired by Le Corbusier's and other architect's ideas, many Modern buildings, such as New York's World Trade Center and Chicago's Sears Tower, were to have all glass facades. The evolution begun by the Chicago School of skyscraper design could now be completed.[51] The new Modern buildings could be lit using natural sunlight.[52] In addition, interiors could be large and spacious, the voluminous spaces created by Frank Lloyd Wright could now be vastly expanded in size, and fresh air and sunlight could reach the innermost parts of a building. Le Corbusier declared, "The façade, since it no longer has any compulsory carrying function, can be considered a mere membrane between the outside and the inside."[53]

Le Corbusier and the Modernists were excited by the vitality of the American skyscraper. Le Corbusier wrote:

> Imagine all this junk, which till now has lain spread out over the soil like a dry crust, cleaned off and carted away and replaced by immense clear crystals of glass, rising to the height of over 600 feet; each at a good distance from the next and all standing with their bases set among trees.[54]

THE RADIANT CITY

Le Corbusier called for a new form of urban design based on the new technologies of his time, and in 1925, he exhibited his Plan Voison. On Paris's Right Bank, almost everything was to be demolished, bulldozed, except for the Louvre. Instead of narrow, medieval streets or luxurious Beaux Arts boulevards there was to be a broad expanse of open space, parkland, with a regular set of tall cruciform high rises. At the center was to be a railroad station and highways were drawn to it as straight lines, without regard to topography or sentiment. The skyscraper in the park as a solution to the problems of urban congestion and pollution was put forth.[55]

In Le Corbusier's new Radiant City (Ville Radieuse), as he called his new urban vision, every person was to have access to the park, if only after a long elevator trip. Or they could look out on the greenspace far below through their windows. Stores were to occupy street corridors in the sky, never to be open to a street on the ground.[56] Some people then and now find Le Corbusier's idea of the skyscraper in the park both alluring and intellectually satisfying.[57] Why not concentrate buildings and

densities so that open space is preserved? The concentration of buildings to create large open spaces idea continues in modified forms to this day in the concept of "cluster" zoning.[58] Take a piece of land that could support 50 houses rather than building them on 50 lots; concentrate them into attached or semidetached buildings and use the resulting open space to preserve environmentally sensitive wetlands or to provide large open playing fields or natural landscaping. Many suburban office parks have a few mid-rise buildings surrounded by acres of parking; but Le Corbusier didn't foresee what the automobile would do to his open spaces.[59]

Le Corbusier's house plans were also stark and utilitarian. He offered advice to interior designers and the public in an article in the *New York Times*, "[A home] should be nearly empty. A minimum of furniture is aimed and built in whenever possible, like bunks on shipboard."[60] By the latter half of the twentieth century and beyond, as will be discussed in the chapter on urban renewal, many would find the Radiant City plans alarming and seek to counteract the influence that Le Corbusier has had on cities across the world.[61]

Modernism Dominates World Architecture

Modernism's ideas were also popularized by the Congrès International d'Architecture Moderne (CIAM), an organization that included planners and architects active in Europe, the United States, Africa, and South America.[62] Founded in 1928, it held periodic conferences until it was disbanded in 1958. Most prominent of these was the Athens Conference in 1933. It began on board the *SS Patris II* as it sailed from Marseilles to Greece. By the time the conference was over, Corbusier and the other Modernists in attendance had produced the famous Athens Charter.[63] The Charter helped articulate Modernism's guiding principles of skyscrapers surrounded by large open spaces, rigid separation of land uses, large superblocks serviced by highways, and strict limits on building ornamentation and design. Modernism had succeeded in developing a new ideology for the twentieth-century city.[64]

US Modernism

As the United States returned to prosperity after decades of depression and wartime austerity, Modernism began to inform new building projects in this country. For example, the Modernists seized upon postwar concerns that US cities were in decline to boost their new architecture and oppose the old line City Beautiful advocates. Jose Luis Sert, the Catalonian

postwar head of the CIAM who had relocated to the United States, wrote the influential book *Can Our Cities Survive?* A question he answered by asserting that only Modernism aesthetics could make urbanism adapt to twentieth-century life.[65] Another great Modernist theorist, Sigfried Giedion, simultaneously placed Modernism at the pinnacle of the entire history of architecture and dismissed that heritage as now being irrelevant because of the arrival of Modernism.[66]

The US Modernists had been held back, despite scattered efforts, by the popularity of Beaux Arts classicism inspired by the 1893 Columbian exhibition in Chicago. In contrast to its demise in Europe decades earlier, Classicism took a longer time to be supplanted in the United States perhaps because there it lacked the destabilizing effects that had swept over Europe.[67]

Modernism had first gained notice in the United States because of the monumental 1932 International Style exposition at the Museum of Modern Art organized by Philip Johnson and Henry Russell Hitchcock.[68] The first Modern housing projects were completed in the 1930s as the United States made tentative steps toward facilitating the development of large housing projects for the poor.[69] But after smoldering below the public's conscious in the 1920s and 1930s, Modernism burst forth in power and ubiquity after World War II. Suddenly cities and companies that saw themselves as progressive and modern wanted to show they were thoughtful and current by having their own Modern buildings constructed.[70] After the war, Modernism became a dominant ideology at many architecture schools in the United States. For example, the Bauhaus refugee Walter Gropius became chair of the architecture department at Harvard. Sert was Dean of the Harvard's Graduate School of Design from 1953 to 1969. Elsewhere, Mies van der Rohe ran the architecture school at the Illinois Institute of Technology and Louis Kahn's Yale Art Museum was another seminal building popularizing the new style.

Phillip Johnson built his famous Glass House in New Canaan, Connecticut, in 1949. This Modernist jewel has all glass walls and a strong horizontal roof and baseline. Set on his semisecluded estate, Johnson succeeded in minimizing the disassociation between the exterior and interior of a house.[71] In Chicago were Mies van der Rohe's apartment houses along Lake Shore Drive and office buildings in the Loop. Again, there are minimalist glass-skinned buildings that convey serene science-based aesthetics to their neighbors.[72] Also in New York, the United Nations building, designed by a group of architects led by Le Corbusier, seemed to be designed to tell the public that the International Style could lead to a new world, where war would be eliminated and all the countries of the earth could be united in harmony.[73]

Discontent

The influential husband and wife architects Robert Venturi and Denise Scott Brown played an important role in moving architectural theory beyond Modernism.[74] They praised everything that Modernism was against: playfulness, ornamentation, and a careful attention to local vernaculars.[75] In their book *Learning from Las Vegas* they celebrated kitsch and the public's taste, pointing out that the architecture of that city's Strip, as seen from the perspective of a speeding car, was closer to what people wanted in their communities and more relevant to the enjoyment of city living than distant abstract Modernism. Vernacular architecture, as promoted on the Las Vegas Strip, was democratic, while Modernism, which claimed to empower the commonpeople, was not.[76] And much of the public disliked Modernism.[77]

The Venturi/Scott disagreement with Modernist architecture was accomplished, in part, by the observation that divided all buildings into either Ducklings or Decorated Sheds. A Duckling is a building whose shape conveys its meaning. The team came up with the term *Duckling* from a restaurant on Long Island, New York, shaped like a duck. The building's purpose is readable by its shape. The alternative building type in this dichotomy is the Decorated Shed. In this case, the architect takes a box and adds ornament to its facade. The building's meaning is conveyed by the ornamentation.[78] A current example of the Decorated Shed is the way abandoned Walmarts have been converted into churches. Change the signage and the building's meaning changes.

Venturi and Scott examined what happens after Modernism decrees there should be no ornamentation and that form should not deviate from function. They pointed out that there is nothing left other than plain boxes and that these have no way to convey a building's meaning to people. Eventually, much of mainstream architectural thought came around to positing that a major role of architecture is to inform the dialog of the street and create a conversation with city residents,[79] but Modernist buildings are silent because of the constraints of Modernist architectural idioms.[80] Without the communicative ornamentation of the decorated shed or the iconographic shapes of the Duckling, Modernist designs can have a negative impact on their surrounding cityscape.[81] As Jane Jacobs would come to say, this is the curse of the Modern City: it can be deathly dull.[82] It was even worse as residential architecture, Catherine Bauer, the influential housing activist, was to complain.[83] And while Lewis Mumford initially liked the new public housing projects with their Y shaped, cruciform or zigzag patterns placed on large parcels of land aligned with the sun, many of their residents never did. To many, these designs lacked the

excitement of a regular city block. This is the root of the health concern with Modernism: its dullness and disconnect from streetscapes negatively impact physical activity and make streets feel unsafe.

Even in the 1960s United States, Modernism was opposed by some. While the 1963 Pan Am (now MetLife) Building, designed by a consortium of architects that included Gropius, was loved by many architects, it was disliked by others for what it did to the much-loved Beaux Arts formality of Grand Central Terminal.[84] The juxtaposition of the Pan Am Building with Grand Central Terminal harmed the view from both sides of Park Avenue and it demonstrated the developer's prioritization of profits over aesthetics. In a short time, Modernism went from being radical to being orthodox; for many critics, it became the standard vocabulary of big business, big government, and oppressive bureaucracies.[85] To these critics, it was inhumane.

It should be noted that one of the first great Modern buildings was Peter Behrens' design for the German Company AEG and Le Corbusier's Plan Voison was named after its sponsor, a French automobile company. Thus corporations were involved with Modernism from its beginnings and Modernism continued to be heavily dependent on corporate money through its final triumphs in the United States.[86] However, by the 1960s, Western intellectualism was shifting away from its interest in manufacturing technology and toward anticorporatism, and there were growing concerns about the effects of massproduction and consumer culture on humanity and the human spirit.[87] In this new ideology, an architectural style based on the benefits of machine living and adopted as the personal style of multinational corporations became a target.[88] Vincent Scully, the architecture critic, declared that US Modernism had "no real urbanism, no social purpose to speak of, and none of the rationalistic passion which, whether always apparent in the forms or not, was the driving emotional force behind the European development."[89] The social justice justification for Modernism that was present at the beginning of the European movement in the 1920s was gone by the 1960s in the United States.[90]

Furthermore, much of the public never learned to love the Modern style.[91] The scale was too often wrong and far too big for its place. Sometimes, it figuratively cast a dark shadow on human aspirations rather than liberating them. The overuse of concrete was a particular problem. The dependence on concrete as a building material perhaps reached its zenith in the Brutalist Style of Modernism (called Brutalist because of the French term for its unfinished concrete but a popular name because of the psychological effect on passersby and occupants).[92] These concrete-dominated buildings seemed cold and unwelcoming. As part of a streetscape, they could create dead zones of inactivity.

Modernist Housing

Modernism had other problems. Le Corbusier wanted to make houses machines for living,[93] but the reality of dwelling in one of his designs was difficult. Costs were kept low, but often at the expense of comfort. Le Corbusier's initial Radiant City design provided only approximately 150 square feet of living space per person. In our time, a new US house provides about 1000 square feet per person. But no more area was needed, Le Corbusier thought, because city inhabitants would be spending their time outdoors or in the provided theaters, communal gyms, and upper-floor commercial strips.

Mid-century housing advocate Catherine Bauer posited several reasons for Modernism's failure. One is that by the time the post–World War II era had come into being, the world was substantially different from what it was in Modernism's early days 30 years before. Cities and societies were much more affluent, and technology, in the form of cars, telephones, television, and household appliances, was vastly changing family life. Servants were no longer needed or wanted. The middle classes were using these new technologies to focus inward on the household life of the nuclear family and away from society-wide activities. Modernism's emphasis on communal life and socialistic living arrangements were out of touch with the individualism and cold war sensibilities of the 1950s. For the rest of society, values and ideologies had changed, but architecture lagged behind and thus it was now out of step with contemporary values.

But a greater problem, Bauer pointed out, was that the Modern movement, which claimed to be based on scientific methods, had little science to back it up, and architects and planners did not conduct new research to enable them to better understand how the built environment affected health. While some of their work was based on observational studies, case reports, and published articles of the late nineteenth- and early twentieth-century researchers, very little of Modernist theory had a real sound scientific background beyond the theories first put forward by Southwood Smith. In the absence of hard science, Bauer argues, "The three leaders [Le Corbusier, Mies van der Rohe, and Gropius] who had embraced 'science' reverted to the old prima donna architect's role, little concerned with the application of advanced technology and social science to the human environment."[94] So in the absence of quantifiable data, the ego of the architect trumped the needs of the people. Bauer also rejected the idea that Le Corbusier had put forth that the house should be a machine for living. Writing in the *New York Times*, Bauer suggested:

> For an automaton a machine is beautiful because it is efficient and increases his own efficiency. For an intellectual a machine is beautiful because it is

> a result of pure intelligence and releases man for further intellectual effort. But for the average man in between these two extremes, a machine is either a danger or an annoyance.[95]

While the US middle classes rejected Modernism, some upper-class people commissioned some houses that continue to be admired. For example, Mies van der Rohe's Farnsworth House and the many private homes designed by Richard Neutra in Southern California still inspire.[96] There are many examples of successful Modernist housing both here and abroad. However, some houses were less successful. Novelist Tom Wolfe, in his 1981 send-up of Modern Architecture, pokes fun of how so many wealthy people chose to live in buildings that they so much hated in their hearts:

> O Beautiful, for spacious skies, for amber waves of grain, has there ever been another place on earth where so many people of wealth and power have paid for and put up with so much architecture they detested as within thy blessed borders today?[97]

MODERNISM AND THE CITY

Modernism dramatically transformed US cities.[98] If Wright's Broadacre City was the archetype for the suburbs, then Le Corbusier's Radiant City was the prototypical urban design and it inspired central city redevelopment across the globe.[99] Incorporating Corbusier's urban utopian vision, there is the Illinois Institute of Technology in Chicago designed by Mies van der Rohe. San Francisco has its Embarcadero Center. Brasilia was planned by Lucio Costa and Oscar Niemeyer using strict Modernist idioms and Chandigarh, India, was laid out by Le Corbusier himself. As will be seen in the chapter on urban renewal, these large projects created problems of their own because of their disconnect with streetscapes, their problematic circulation patterns, and their heavy use of unfriendly building materials.

Le Corbusier's Radiant City met its symbolic end in the dramatic abandonment and demolition of St. Louis's Pruitt-Igoe and other low-income housing developments (see Chapter 7 for a more detailed discussion of the problems associated with public housing). For many concerned about Modern architecture, the decline of Pruitt-Igoe represented a strong repudiation of Modernist ideals. This was because Pruitt-Igoe had represented all the hopes of Modernism, all the ways science and the future could save cities and the poor when it opened in 1955–1956. Pruitt-Igoe started from the best of intentions. St. Louis's mayor Joseph Darst wanted to remake St. Louis into a modern, New York–style metropolis with plenty

of high-rise housing. There was a great need to house the poor and the Blacks of the city and there was federal money to pay for it. To bring this all to fruition, Minoru Yamasaki, an up and coming architect who also designed the World Trade Center in New York City, was hired to design the buildings that were laid out in a Corbusian skyscraper-in-the-park manner. But Pruitt-Igoe represented as much as a social-political failure as it did an architectural defeat.[100] Budget constraints and racism doomed the project; there was never enough money to make the development work. Segregation caused half the project to be reserved for Blacks, half for Whites. But then Whites refused to live in any part of the project, making it necessary to rent out all the units to Blacks. Unfortunately, Blacks preferred the low-rise housing being freed up by Whites rapidly abandoning the city rather than the concrete towers in the new project. Wealthier potential tenants, who could afford alternatives, stayed out of the projects. So only the poorest, the least powerful, moved in. The finances were precarious to begin with, forcing cutbacks in construction quality, and then as rents failed to provide for maintenance, operating conditions quickly deteriorated. There was also the strange situation of the skip floor elevator system, necessitating tenants to walk up or down stairs once the creaking elevators made it near their floors. The corridors in the sky turned out to be gauntlets, guarded by gangs, exposing tenants to abuse and danger.[101] The deterioration accelerated and by 1972 the buildings were imploded, along with any remaining romanticism that Modernism could assist the poor through designing houses as machines for living.

Housing Successes

One major surviving group of single-family Modernist-inspired houses is the Eichlers, built by Joseph Eichler between 1950 and 1974. These flat-roofed, open-style houses, inspired in part by Phillip Johnson's Glass House, are in high demand, especially in California's Silicon Valley, where they can provoke a nostalgic yearning for the simplicity of the 1950s.[102] Though owning an Eichler can be frustrating when it comes to maintenance and repair—the houses are prone to leaks and replacement materials are hard to find—people advertise their homes as Eichlers in real estate ads and at least one neighborhood in the San Francisco Bay Area has received architectural protections.[103]

There are also a number of large-scale, successful middle-class projects that were inspired by the Radiant City design, including San Francisco's Park Merced, Los Angeles's Park La Brea, and Co-op City in New York. Each consists of a number of high-rise apartment buildings set in a large park-like setting. They have few or no through streets, just access roads to

parking lots. They are proud examples of the spirit and vitality of Modernism, even if they did not capture the public's imagination. They are financial successes as well. In 2006, Stuyvesant Town and Peter Cooper Village, both large-scale Corbusian-inspired projects developed by the Metropolitan Life Insurance Company in the late 1940s in New York City, sold for $5.4 billion (the purchasers later declared bankruptcy).[104]

An Assessment

Today, almost 100 years after the beginnings of the Modern movement, we can evaluate the overall effects of the International Style using our framework of equity, sustainability, and health. The social equity intentions of Modernism are laudable and its stated goals of assisting the poor are admirable. But Modernism, as implemented, was terribly destructive to the poor people it was supposed to help.[105] Though it began out of concern for the living conditions of the poor, it never asked them how they wanted their houses designed and most with any resources chose not to live in Modernist housing.[106] Thus it tended to be occupied by people who were powerless to avoid it. Perhaps if the Modernists had consulted the poor they were designing for and had asked them about their needs and housing desires, the excesses of Modernist low-income housing development could have been avoided. Despite its intentions, it could be said that Modernism was a failure in terms of equity.

With exceptions, Modernism has also failed from a sustainability perspective. The Modernist projects were dense, but often they were not as dense as the neighborhoods they replaced. Barely 50 years after its triumph, a large percentage of Modernist low-income housing has been targeted for replacement.[107] Outside of New York City, most high-rise low-income housing has been torn down, and many of the remaining high-density projects are slated for complete rebuilding. Perhaps this doesn't reflect Modernism itself but a longstanding reluctance to properly fund low-income housing services (see Chapter 7). While the use of machined housing components should be praised because they do reduce housing costs, many of the building techniques proved beyond the competence of the age's builders and the projects often seemed to leak or fail almost as fast as they were opened. For whatever reason, the buildings proved less sustainable than most postwar single-family dwellings.[108] So Modernism's record on sustainability is mixed. It tried to be low maintenance, but its reliance on unproved technologies and materials caused numerous long-term problems.

Modernist housing was based on principles of allowing sunlight and ventilation and was certainly healthier than the worst of the slums they

were designed to replace.[109] But all housing built in the past 50 years in the United States has a strong health-based component because of the dominance of building codes, and the Modernist buildings were, if anything, less healthy than their competitors. Given the problems with maintenance and the high crime rates these projects seemed to attract, it would appear that Modernism, despite its basis on the science of healthy housing, was a failure.[110] Ironic for a movement based on the idea that it could promote health, Modernism's greatest defect was its unhealthiness. The crime-infested housing projects point to its lack of defensible space.[111] Its leaking windows helped produced generations of asthmatics, and its acres of parks and plazas failed to promote physical activity because they were poorly maintained, badly programmed, and stingily landscaped.[112]

None of the above speaks to the aesthetic strengths or weaknesses of Modernism. There are many design successes and even a plain glass box can have an austere beauty. The spring of 2007 represented a time of critical re-evaluation of Modernism. The Victoria and Albert Museum's Modernism exhibit traveled to the Corcoran Gallery in Washington D.C. In New York, the Metropolitan Museum of Art showcased the Modern Movement of Barcelona, and the Museum of Modern Art (MOMA) presented a 75-year retrospective on the original International Style show. The large room of drawings, renderings, models, and plans at MOMA presented some of the original exhibit along with a critique of its omissions and highlights. The exhibit's models hinted at Modernist promises. Project drawings presented its concern for health and social equity, while the accompanying text documented its theory and ideals. Modernism at its best represented an effort to improve humanity using what was then the up-to-the-moment advances in health and scientific knowledge. Modernism failed to perfect humanity, but at least it tried.

CHAPTER 7

PUBLIC HOUSING

THIS CHAPTER IS A BROAD OVERVIEW OF HOUSING PROGRAMS in the United States in the twentieth century. It begins in the 1920s at a time when there appeared to be a halt of progress in improving housing quality for the poor. The chapter provides an overview of how two important reformers emerged who would change the understanding of the nature of the housing problem from being a regulatory to an economic push for public housing program. The chapter then describes the American Public Housing Association's program to promote healthy housing and then moves on to outline the public housing program itself. This is followed by a discussion of the problems associated with the program and the search for alternatives. It also covers some of the research that these problems promoted including research on crime, rats and overcrowding, and defensible space. The chapter concludes with a brief outline of current housing programs and an assessment of the public housing program itself (table 7.1).

Introduction: A Reform Movement Stalled

By the 1920s, the tenement law movement organized by Lawrence Veiller had stalled.[1] This loss of momentum was partly due to its successes; most large cities had housing laws modeled on Veiller's guidelines.[2] But it was also because housing advocates had seen the limits of the tenement laws.[3] They were disenchanted with a reform agenda that concentrated on the development of building codes and zoning for the benefit of new middle-class houseowners, but had failed to improve housing for too many poor tenants.[4] The laws' failures were the result of political and logistical realities that reduced the ability of tenement reformers to address existing conditions. In a few cases, codes required the retrofit or demolition of the worst housing, but most of the time, existing construction was allowed

Table 7.1 Key dates in US public housing

Event	Years
Catherine Bauer's Modern Housing published	1934
Housing Act authorizes the FHA	1934
APHA Committee on Health and Housing	1937
Wallace – Steager Housing Act	1937
Housing Act calls for 800,00 units of public housing	1949
Housing Act prioritizes urban renewal over housing	1954
Edward Hall's The Hidden Dimension published	1966
HOPE VI program begins	1992

to remain "as is" until it was substantially renovated—an infrequent occurrence. This compromise had been necessary because there was no place to house the poor while entire neighborhoods were reconstructed; and landlords, who proved to be a powerful lobby, could have their opposition blunted by exempting existing buildings.[5] In addition, most new housing was being built in middle-class neighborhoods, either on the periphery of cities or in the suburbs, so the inner core of the slums was untouched. Thus despite tremendous improvements in housing for a portion of America, housing conditions in the tenement districts, the very areas where the need for the laws had been identified, continued to be problematic.[6] Illustrative of this failure, two decades later the 1940 U. S. Census still found that 45 percent, or almost 16 million housing units, lacked complete plumbing facilities; 35 percent or 13 million lacked flush toilets; and 20 percent were overcrowded.[7] While many of these substandard units were in rural areas, a large percentage of urban housing also needed improvement.

New Ideas on Housing

The failures prompted a new generation of activists to re-evaluate the housing movement's methods and assumptions.[8] The housing movement in the United States had initially relied more on health, social, and moral arguments than economic concerns.[9] That the working poor could not afford decent housing was not a prime motivation for many earlier housing reformers. On the contrary, the philanthropy at 5 percent movement was based on the assumption that the builders of model tenements could, in fact, create economically viable housing for the poor without any subsidies.[10] By the 1920s, however, some housing advocates, perhaps learning from failed experiments to build model tenements and the limits of tenement legislation, began to study how high construction and maintenance costs hurt tenants and for much of the decade focused on how to create new building techniques and use new materials to reduce

the cost of housing.[11] But support for the idea that government should build affordable housing did not become widespread in the United States until the Great Depression.[12]

Two new housing advocates appeared on the scene, supplanting the influence of Veiller. Together, Edith Elmer Wood (1875–1945), who would eventually serve as a consultant to the United States Housing Authority, and Catherine Bauer (1905–1964), who would be active in housing policy debates for the next 30 years, pushed forward the idea that government, particularly the federal government, must be involved in constructing housing for the poor. Wood based her arguments on the economics of housing production, demonstrating that it was impossible for low-wage workers to afford decent housing.[13] In a major paradigm shift, she wrote, "[P]oor housing was not the result of the malfeasance of a few landlords and tenants but of the malfunctioning of the modern industrial system and therefore must be treated differently from the traditional regulatory approach used by Veiller."[14] Wood argued that only the government could bridge the large gap between what the poor could afford to pay and what it cost to provide housing.[15] This represents a significant change in the assumptions that had driven housing reform from the time of Chadwick's sanitary surveys through the years of Veiller's housing laws. After Wood's analysis, housing became widely seen as an economic problem, not one caused by the morals of the poor or ignorance of property owners. Therefore, new policies were needed to promote the construction of decent affordable housing.[16] This shift in the conceptualization of the tenement problem to its being an economic issue was to help lead to the development of public housing programs.[17] But ignoring the core truth of this would also contribute to the problems of public housing in the United States: providing housing for the poor was costly and there was no feasible way around this expense.[18]

Building on the works of Wood and others, a major mid-century champion of public housing construction was Catherine Bauer. She was born in Elizabeth, New Jersey, and attended Cornell and Vassar. Later she married an architect, William Wurster, and moved to California, where she continued to work on housing issues while at the University of California at Berkeley. Determined to solve the United States' housing problems, Bauer helped create a new coalition of urban activists, public health advocates, labor unions, and others in support of a national housing policy in the 1930s and 1940s.

Moving forward from Wood's new assumptions about housing affordability, Bauer considered and rejected other options for solving the tenement problem before settling on the need for government support for new construction of low-income housing. She thought that the efforts

of the settlement houses, which stressed education and social work, could not begin to address the housing needs of slum dwellers. Furthermore, there was a health component to her ideas.

> Every day there is new evidence to show that tuberculosis and rickets, infant mortality and infectious diseases, death-dealing fires and street accidents, juvenile delinquency and adult crimes occur at a vastly higher rate in congested or unsanitary neighborhoods then they do in good residential areas, or in new projects housing families who have come directly from slum homes.[19]

Catherine Bauer toured Europe in 1932. During that visit, she viewed efforts to build worker housing and met many of the cutting-edge architects of that era.[20] England, France, and Germany had made major commitments to build housing and over 4.5 million units of housing had been constructed by governments in Western and Northern Europe after World War I. But while there had been some limited federal funding of worker housing during that war in the United States, its end caused an abrupt halt to federal housing programs. So at a time when providing housing had become a basic responsibility of the government in Europe, in the United States there was little government involvement in housing beyond some emergency depression-fighting job creation programs for any segment of the population.

Bauer returned to the United States and published the book *Modern Housing*[21] in 1934. In it, she praised the volume of European construction, but also pointed out that this new housing was both better and different than what had existed before. Up to this time, housing advocacy in the United States had focused narrowly on providing ventilation and sunlight, securing access to indoor plumbing, and reducing overcrowding, the lessons learned from the nineteenth-century sanitary surveys and ideas on housing and health consistent with Thomas Southwood Smith's fever book.[22] Bauer pointed out there was more to housing than these vital minimal standards; housing had to be supportive of family life and help make people full productive citizens, even if the family was very poor. Recognizing that this expansion of the definition of housing quality was not the norm in the United States, Bauer called not just for a reform of existing practices, but a radical new approach to the financing, design, construction, ownership, and management of housing. From this grew the idea of public housing in the United States.[23]

A Renewed Movement

Bauer saw public housing, in other words, public-financed housing, as part of a comprehensive program to eradicate the blight of slums. These

ideas had a fundamental health component, now broadened to include the health of families as well as individuals. Bauer pushed forward her efforts to create a national political constituency for public housing that replaced Veiller's older housing law movement that had declined 15 years earlier, in part because of his strong opposition to government financing of housing. She worked with labor unions, social activists, and other like-minded people to energize a new housing coalition. But it was the Great Depression that ultimately sparked action. In the cities, unemployed slum dwellers lived in dilapidated housing because they could afford no better options. In the suburbs, new housing units stood vacant because no one had the financial resources to buy them.[24]

The collapse of the home mortgage industry caused by the Depression created widespread suffering and it became clear to President Roosevelt's administration that access to capital for homeowners was a problem. If families could not get mortgages, they could not purchase homes. Thus creating stable financing mechanisms that could assist the private sector to develop housing was a priority for the New Deal.[25] Housing was to become just one of a series of initiatives that were part of the New Deal that helped shape the built environment including building schools and hospitals, rural electrification, public works, and other major programs.

One of the first federal efforts to spur housing construction was the Housing Act of 1934. Included in its provisions was the establishment of the role of the federal government in the mortgage industry. From that time to our current era, there has been a two-tiered approach to housing policy in this country.[26] The wealthy and middle class receive support through mortgage guarantees, quasi-public credit agencies, exemption from capital gains on the sale of a primary residence, and the income tax deduction for mortgage interest.[27] Meanwhile, at a greatly reduced relative expenditure of public funds, a small number of low-income people receive rental assistance or benefit from subsidies for construction of rental properties and low-interest mortgages for affordable rental properties.[28]

The 1934 Housing Act helped create this two-tiered approach.[29] It established the Federal Housing Administration (FHA), which would eventually help promote a large-scale increase in housing quality across the country. The FHA was given responsibility for assisting the mortgages industry including underwriting of mortgages and defining what constituted qualifying housing.[30] The FHA, along with its related agencies, helped create new housing quality guidelines and, through its underwriting standards, dramatically improved quality.[31] New housing was required to have minimum room sizes, minimum lot square footages and setbacks, ventilation, indoor plumbing services, and complete kitchen facilities.[32] Since buildings required their buyers to qualify for FHA loans, they had to build to the standards of the FHA.[33]

But this federal government intervention into the housing market through the establishment of national standards for mortgages also had negative consequences.[34] For the most part, inner-city tenements could not meet FHA standards and thus the rehabilitation of many rental properties could not be funded under these programs.[35] In addition, mid-twentieth-century federal mortgage standards had provisions prohibiting granting of mortgages to Blacks and other minorities and proscribing lending in neighborhoods that included Blacks or were at risk of being integrated.[36] To facilitate the enforcing of these race-based regulations, maps were drawn up indicating which neighborhoods were to be denied participation in federal mortgage programs, a practice eventually known as redlining.[37] Without access to mortgage capital, many inner-city neighborhoods would deteriorate even as suburban and White neighborhoods were being upgraded to higher standards.[38] And without access to the government-assisted mortgages, many African American families were not able to take advantage of the wealth-generating effects of homeownership.[39]

The Public Works Administration (PWA) provided funding for some limited housing for low-income families.[40] St. Louis and other cities were able to use this support to experiment with new housing types and some of the experiences with this small program helped inform the larger-scale efforts that were to follow.[41] But the scope of the PWA housing program was far too modest to make a dent in the country's housing problem.

Throughout this period, there was a tension between those who just wanted to focus their attention on housing problems and those who made the connection between housing quality and the broader social ills of the day.[42] The latter group built upon Wood's work on poor housing and poverty. Bauer insisted that housing was a broad problem encompassing economic, physical, health, and social dimensions. She continually fought for a large set of actions to help tenement dwellers, but the resistance to government involvement in social programs was too strong and new federal housing programs concentrated solely on housing and thus goals regardingthe social dimensions of housing were abandoned.[43]

The American Public Health Association and Housing

Even while the public health profession in general was drifting away from urban planning and social policy in favor of the individual medical approach to health, the American Public Health Association (APHA), then and now one of the largest and most influential public health coalitions, continued to be highly involved in housing. The APHA organized

its Committee on the Hygiene of Housing in 1937, and APHA president Charles Edward Winslow periodically reported on its activities in the *American Journal of Public Health (AJPH)*.[44] The committee set for itself the goals of developing standards and procedures for improving and maintaining the quality of housing, and it worked to promote the incorporation of health principles into the actions and policies of housing advocates.[45] As part of this effort, the committee published its *Basic Principles of Healthful Housing* in 1938. These new guidelines for healthy housing represented the "fundamental minimum of physical, mental, and social health."[46] They included both the minimal standards of Veiller's era and also the family social and livability standards that Bauer had promoted.[47] Throughout this time, housing and health advocates continually stressed the connections between tenement living and disease.[48] Bauer and other reformers believed that housing was responsible for poor health, so they advocated for demolition of the worst units and the development of a comprehensive national program of housing construction.[49]

Public Housing Begins

Dissatisfied with the 1934 legislation because of the many limitations in it, Bauer and her colleagues continued to press for a large-scale, national program to fund public housing.[50] Joining in this effort, the APHA called for the construction of as many as 13 million units between 1937 and 1945.[51] Finally, Bauer helped write the federal housing law of 1937, popularly known as the Wallace–Steagall Act after its two congressional sponsors, which marked the beginning of the major federal effort to fund low-income housing. The 1937 Act provided for the creation of the U. S. Public Housing Authority, Bauer was to serve as its director, and called on the states and cities to create local public housing authorities.[52] These local authorities could then build projects for low-income families through state and federal subsidies.[53] While the efforts to build public housing in the United States never came close to matching the scale of effort in Europe, the next two decades marked a high point in the housing movement in this country.[54] Bauer was also heavily involved in the much compromised housing law of 1949, which set the stage for most of the construction of public housing in the United States and which contained the first federal funding for slum clearance (figure 7.1).[55]

The general procedure established by these acts for developing federally assisted public housing was for a local housing authority to be organized, which required state-enabling legislation. The housing authority would then identify a need for housing and a location for a new

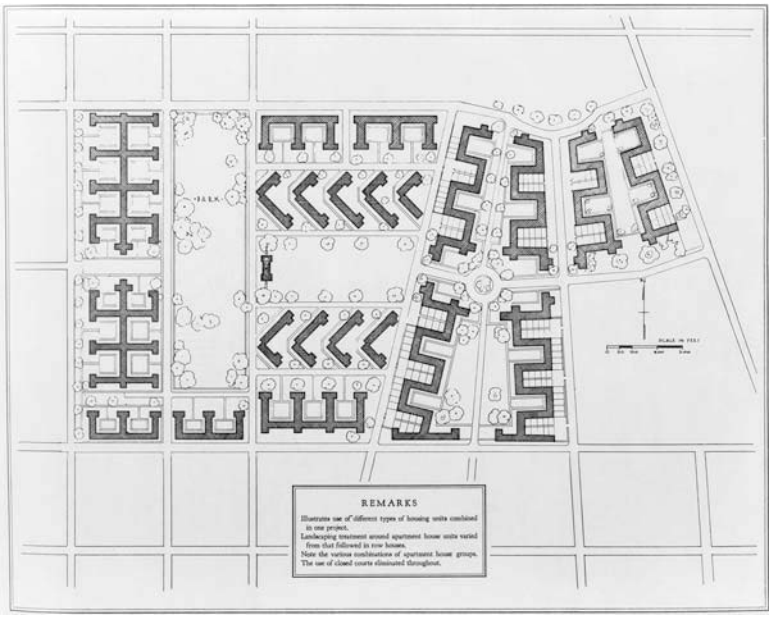


Figure 7.1 Public housing site plan

development to be built. Based on this need and preliminary project ideas, the housing authority would apply for federal assistance. If the application was approved, the development would go forward, with the federal government closely involved in each development step ending with final approval of plans and budgets, after which the federal government advanced funds for construction. Finally, the completed project would be opened to tenants and any excess funds were to be returned to the federal government (this rarely happened).[56] Under this program, federal funds were only used for initial construction costs. All maintenance, operating, and future capital improvements were paid for by the local housing authority using tenants' rents.

This development process included two potentially problematic features that would in combination create problems with the quality of federally financed, local government-owned public housing in this country. First, the model legislation that set up the housing authorities gave mayors the responsibility for appointing board members who oversaw the local programs.[57] The effect was to highly politicize the site selection, development, and management process.[58] In the hands of mayors, many of whom were racially biased against Blacks, this political process set the stage for the problematic placement and tenant selection

policies that afflicted many public housing developments.[59] As a result, many developments ended up on marginal properties far from transit and services or were used to reinforce existing patterns of racial segregation.[60]

The second problem was the short- and long-term funding policies set forth in public housing legislation.[61] Development costs were capped in part to keep the final housing quality low and to maximize the total number of units while minimizing costs to the taxpayers.[62] To keep public housing from being competitive with the units provided by private realtors, the size of bedrooms, the quality of finishes, the amenities, and other factors that could have made these units a success were kept to a minimal standard or prohibited. Thus the quality of public housing was purposely set to be low so that only the most desperate would abandon the tenements to live in the new units. This intentional downgrading of quality protected private housing and helped minimize the opposition of real estate interests.[63] In conjunction with the problems of Modernist architectural theories, it also set the stage for high maintenance costs because flimsy construction was harder to keep functional. Furthermore, the use of rent paid by the tenants to pay for maintenance was predicated on the ability of these rents to cover maintenance, energy, and other expenses.[64] But as bouts of inflation raised operating and maintenance costs and the projects came to be the home for the very poorest of residents, projects were doomed to a downward spiral of delayed maintenance; the loss of higher-income tenants; further maintenance cutbacks; and ultimately, the abandonment of units, whole buildings, and entire projects.[65] Thus poor initial construction quality and lack of sufficient maintenance funds created problems in many projects. Later, the deterioration of the projects was used by critics to denounce both tenants and the whole public housing program itself.[66] But this systematic financial starving of public housing went against Wood's warnings that housing quality was expensive and impossible to support on tenant rents. These financially and politically imposed constraints ignored Bauer's arguments that housing problems needed comprehensive programs that could only be addressed by large-scale public expenditures.

Just as the 1937 Act gained momentum, World War II put limits on housing construction, though there were some projects constructed to house war industry workers and their families. Until peace returned, the supply of housing was limited relative to the demand and by the end of the war, the United States needed over 12 million new housing units to house people of all economic levels.[67] To meet this challenge, builders and mortgage banks lobbied the federal government to concentrate its efforts on suburban single-family construction.

THE 1949 HOUSING ACT

Faced with this counterthrust on housing policy, advocates launched a new initiative to persuade the federal government to commit to the public housing program. So Bauer and others redoubled their efforts as World War II ended and the housers, as they had come to be called, grudgingly worked with suburban development interests to secure passage of a new housing bill. They succeeded, after lots of compromise, in convincing President Truman to make housing a priority for his "Fair Deal" program.[68]

The Housing Act of 1949 also created a system of federal mortgage insurance, the federally financed urban renewal program, and authorized the construction of 800,000 public housing units. Federal budgeting is a two-step process. First, an expenditure is authorized. Later, funds are appropriated. In the case of public housing, units were authorized, but ultimately, funds were appropriated for only a fraction of the total. In addition, while the Housing Act of 1949 set a goal of providing decent and affordable housing for all, it reduced public housing construction to the status of an adjunct to urban renewal and slum clearance.[69]

After the Housing Act of 1949 was passed, the battle turned toward fully funding the housing production called for in the law. Every year, Congress had to appropriate funds to allow for that fiscal year's construction and in every budget cycle, the forces opposed to public housing organized to stop new appropriations. Joining this fight, the APHA called on its members to lobby Congress to fund new public housing construction.[70] Eventually, the slow but steady pace of building resulted in about 1.3 million units, though the number was never close to what was needed. By the end of this program, the Chicago Housing Authority built almost 15,000 units of high-rise public housing, New York almost 150,000 of local, state, and federally subsidized units.[71]

By 1954, there was growing opposition to the federal public housing program. Critics continued to maintain that it was expensive, incompatible with US values favoring free market solutions to housing problems, and too likely to result in new housing opportunities for African Americans.[72] Still, activists pressed forward, and President Eisenhower signed the 1954 Act that authorized a large new federal urban renewal program and sustained the federal government's public housing role at a reduced level. Despite the efforts of the housers, the federal will to build more public housing was beginning to ebb. Public housing was being pushed to the side as the federal government turned its attention from the construction of public housing, as set forth in the Housing Act of

1949, to urban renewal with only limited continued housing construction assistance, as outlined in the Housing Act of 1954. This change in focus reflected the compromise between conservatives, who opposed government in general but favored business assistance in particular, and urban activists, who continued to be concerned with the plight of US cities.[73]

Public Housing Problems

From the beginnings of efforts to build affordable housing, the housers recognized that successful developments depended on the layout of the neighborhood and the city, and they worked to incorporate quality design standards into the federal approval process for new developments.[74] Therefore the design problems that were to affect much of public housing did not lie exclusively in the federal government's design standards for public housing. On the contrary, they tended to be the result of the compromises that were necessary to bring the projects to construction within budget constraints.[75] Many of the developments were designed by progressive architects who worked to incorporate the new ideas of Modernism and Le Corbusier into building and unit layouts in an attempt to use the most up-to-date theories of architectural theories of their time. The resulting superblocks and other aspects of Modernist design may have not turned out to be optimal, but the other design guidelines, if they had been followed, might have produced quality housing. They called for ample ventilation, careful layout in terms of circulation, lush plantings and recreational amenities for children, gardens when possible, low densities, access to jobs and other outside-the-project features, and ample parking for the site plans. The units themselves were to have small but adequate bathrooms and kitchens, and an appropriate number of bedrooms for the family size. Construction quality was to be maximized so that maintenance costs would be minimal.[76]

But public housing as implemented often included dilapidated cramped units, dysfunctional elevators, dim lighting, and nonlandscaped exteriors.[77] As noted above, because the appropriating legislation imposed a severe cap on construction costs, quality was minimized and maintenance costs were high. Bauer and her allies spoke out against the impending crisis they could see being preordained by the lack of adequate financial support. But these concerns were ignored as early and often as they were raised.[78]

Public housing's problems were not limited to these construction and design problems. There was also controversy as to where to build the new family developments because many ethnic White communities did not want them in their neighborhoods.[79] These opponents saw the projects as

vehicles for integration, even though public housing was often segregated, and often a major goal was to keep Blacks out of their neighborhoods.[80] Efforts to site housing in Detroit, for example, met with fierce opposition, and ultimately the city passed on federal funds rather than fight enraged voters.[81] Chicago used marginal industrial lands to site projects that walled off its growing South and West side ghettos or simply sited the projects inside its large Black neighborhoods.[82] San Francisco located a project, Hunters Point, on a cold windswept peninsula at the far edge of the city.[83] Similarly, Boston built a public housing development, Columbia Point, on a garbage dump on a remote peninsula.[84] Many developments were either built directly in Black neighborhoods or on the edge as barriers between Black and White communities.[85]

The maintenance issues helped create visual separation between the projects and the neighborhoods. As early as 1952, for example, Boston decided to pave over all the open areas of its family developments in order to save money.[86] A reviewer of the architecture style of the era concluded, "Housing that lacks spirit, dignity, and intellect, that caters only to regulation and production, saps the vitality and degrades the values of its inhabitants."[87]

Some of the most famous and problem-plagued housing was in Chicago, where two of the country's most well-known projects, Cabrini Green and Robert Taylor Homes, were located. Now that they have been demolished, it is difficult to convey the impressions left by the Robert Taylor Homes. Perhaps the largest public housing community ever built, it housed 25,000 people at its maximum occupancy in a series of gray-buff high-rises that stretched along the Dan Ryan Expressway. Each building was dozens of stories tall, evenly spaced every few hundred feet from the next for miles along the expressway. In between the buildings were lots full of weeds and broken-asphalt parking areas. Many of the facades were scarred by plywood-covered windows or smoke stains rising upward from burned-out apartments.

Many cities had fairly successful public housing programs. New York City, for example, has tended to have large numbers of developments with few vacancies, though some of its developments are plagued by maintenance and other issues.[88] This highlights the role of factors other than Modernist designs in public housing problems such as poor management and corruption.[89]

ALTERNATIVES

The effect of these failing projects was to erode public support for further funding of the program, so in the 1960s, federal subsidies to construct

units shifted from family housing to housing senior citizens. For example, the Housing Act of 1961 allocated half of new units to seniors.[90] President Kennedy signed an order prohibiting funding for new high-rise family housing, though already funded projects opened for the rest of the decade. Later, the Housing and Urban Development Act of 1965 incorporated this prohibition into law.[91] It also created a new mortgage program for nongovernment (both for and not for profit) developers of low-income housing, and a new category of housing for the poor—publicly assisted rather than publicly owned—was born. The quality of this assisted housing varied greatly by location, quality of construction, and experience of the developer. Some of this housing represents the best housing for the poor available in the United States today. Others have become as troubled as the high-rise housing of the 1950s and have been similarly reconstructed or demolished.[92]

Housing and Crime

In the 1960s, some sociologists studied the problems of public housing, looking at the projects as an opportunity to study how the built environment shaped human behavior, particularly crime. One criminologist declared, "In a broad sense, land use 'generates' crime in a manner analogous to the way in which it generates traffic."[93] But the relationship between housing and violence is much more complex. In fact, violent crime and drug-related activities are concentrated in public housing, but eventually it turned out there was little statistically valid evidence that it was the physical structure of buildings and developments that were the cause of these elevated crime rates.[94] Once income and other social risk factors were controlled for, the elevated crime of public housing developments turned out not to exist.[95] The potential explanation for this lies in the relationship between poverty and crime, which exist both in and out of public housing, and it was found that "criminal activities diffuse back and forth, from public housing out to the immediate neighborhood, and from neighborhood into public housing."[96] The assumption that public housing itself generates crime, however, was to become one of the rationales for a new policy in the 1990s, HOPE VI, to demolish and rebuild many family public housing developments.[97]

Housing and Health Research

Housing advocates became disenchanted with the quality of public housing and the lack of available scientific data on what should be built and how.[98] It is difficult to conduct certain studies on humans. For example,

we cannot randomly assign families to different neighborhoods and keep them there against their will. However, beginning in the 1990s the program called the Moving to Opportunity Program provided an opportunity to study the impact of neighborhood on low-income families.[99] It was not primarily a health study; it was initiated to make up for past segregation policies of five public housing authorities. Families were randomly assigned housing in their old developments, alternative units in still segregated communities, or alterative units in predominately White neighborhoods.[100] The primary outcomes for the study were employment and education, but there were some limited health questions included in surveys of participants that found that women and girls reported less anxiety and overall better health. There were no benefits for the boys in the program (there were too few men to be analyzed).[101] This study had nothing to say about the design of buildings or developments, however. It studied the effects of neighborhood, not building design.

The 1960s Rat Studies

Researchers in the 1960s turned to other ways of modeling and testing human behavior. One set of studies were John Calhoun's research on rats, crowding, and behavior in the early 1960s. The protocols were simple. The scientists put many rats into a small area and compared their nesting, interaction, and aggression behaviors with those of rats in normal density cages. Calhoun found that under crowded conditions, the sociability of rats declined. They fought more, failed to build nests, and exhibited pathological behaviors including biting and other aggressions. He called the worst of these behaviors and the worst sections of the cages "behavioral sinks."[102] This appeared to give biological plausibility to the concerns regarding urban living and behaviors that had first become identified during the late nineteenth century. When the studies were published, they were interpreted by some to provide explanations for human behavior and it appeared that the rat studies were saying that urban densities were too high and crowding was pathological.[103] Perhaps it even implied that the proper role of government should be to reduce densities, starting in the slums and public housing projects. Calhoun's work was popularized by Edward Hall in his influential 1966 book *The Hidden Dimension,*[104] which continues to be read by planners and architects.

Closer examination of Calhoun's research and similar studies, however, finds serious flaws with their methodologies.[105] For example, the association between density and pathologic behavior was not clear cut. Most important, it was not sufficient to have overcrowding to create a behavioral sink, simply overcrowding rats did not produce behavioral

breakdowns.[106] Therefore, to further stress the rats, Calhoun limited the number of feeding sites—forcing rats to jostle each other for food, but that did not result in pathological behavior, either. Neither simple overcrowding, nor overcrowding with limited numbers of feeding stations, produced behavioral sinks. Next, Calhoun limited the amount of food, itself. Extremely hungry rats gathered at a limited number of feeding sites and finally the pathological behavior emerged. Therefore, crowding by itself did not produce pathological behavior. Behavioral sinks were the result of crowded starving rats that had to fight each other to get to a limited amount of food. Thus the lessons for overcrowded residents of cities were limited.[107]

Furthermore, researchers could not find evidence of pathological behavior related to crowding in humans. The relationship between crowding and social pathology could not be observed in public housing, for example.[108] For one thing, public housing was less dense than the tenement districts from which it drew their residents. In addition, once actual crime rates were measured, as bad as crime was in these projects, it wasn't much different from the rates outside the projects in other low-income neighborhoods. Density itself, therefore, did not seem to be the problem. The international evidence was also contrary to the density–pathological behavior theory beacuse if there was a basic human biological response to density, then it should be observed in every society. But even in places such as Hong Kong, which had densities much higher than any location in the United States, the relationship between crowding and crime could not be found.[109] Faced with this new research, the crowding–social pathology connection passed from scientific discussion though much of the public may still believe it has been scientifically proven.

Defensible Space

A parallel set of studies led to a related hypothesis that it was a lack of defensible space that was responsible for the crime, vandalism, and social pathologies of public housing.[110] Spaces controlled by individual households felt safe; in contrast, "no man's land" was the danger zone.[111] The theoretical basis for the idea of defensible space is that if no one feels "ownership" of public spaces, then crime and social problems can concentrate there.[112] People can only feel they have control over spaces they perceive as within their sphere of influence. In public housing, defensible space implied that the common areas such as entryways, open spaces, hallways, and elevators were indefensible, and therefore that was why bad things happened there.[113] They were dangerous because

of this lack of control. Sociologists and public housing authorities had found that the majority of tenants kept their apartments in good repair even if housing authorities lacked maintenance dollars to maintain them. It was the common areas that deteriorated first. The concept of defensible space appeared to support these empirical findings. In addition, when Oscar Newman, funded by the Federal Department of Housing and Urban Development, studied public housing in New York City, he found that more important to crime and vandalism than density was the visibility of entries from the street and walkways into buildings. A key conclusion from his work was that housing designs should maximize the amount of privatized space, even in public housing and that where space could not be privatized, it should be well visible to passersby and the police, and these features have been incorporated into housing guidelines today.[114]

Public Housing Rents

One cause of the maintenance problems of public housing was the association between rent policy and public housing budgets.[115] In 1969, Senator Edward Brooke of Massachusetts successfully pushed through an amendment to limit rents in public housing to no more than 25 percent of tenant family incomes (since raised to 30% in the face of economic pressures on local housing authorities).[116] The goal was to keep low-income housing affordable and stop housing authorities from burdening tenants with high rents. But the effect was to drive middle-income families out of the projects. Unable to generate enough operating income by charging only their poorer tenants 25 percent of their incomes, housing authorities ended up charging all tenants 25 percent of household income. After a family earned more than a certain amount, it would be cheaper to live outside of the projects. Thus there became a great incentive for any but the poorest families to move out of the projects, resulting in concentrating the most poor.[117] This limitation of revenues, in combination with the inflation that began in the 1960s and reached its peak in the 1980s, caused conditions in public housing to further deteriorate.[118]

Other Federal Housing Programs

By the end of the 1960s, the age of large-scale low-income housing production was over. After 1970, some public housing developments were demolished or substantially reconfigured.[119] In the 1990s, under a federal program called HOPE VI, a number of developments were rebuilt using New Urbanist and other more user-friendly design guidelines.[120] The

federal government also provides some assistance to housing authorities to conduct major repairs and reconstruction of developments.

Since first introduced in the 1960s, some of the federal government's efforts to provide rental housing through mortgage assistance and other programs have also had problems. These have a number of causes. In the first place, the quality of the original construction was only as good as the initial developer and the amount of money available at the time of development.[121]

Rather than provide for direct grants to public housing authorities, the bulk of the federal support for low-income housing at the beginning of the twenty-first century was provided through vouchers, also known as the Section 8 program after its location in the Housing Act of 1974. These vouchers can be given to households, which then search for a landlord willing and able to rent to low-income families, or to specific housing units, which agree to rent units to low-income households.[122] Regardless of the type of voucher, the local housing authority has to certify that units meet health and safety guidelines. For the most part, these vouchers have been successful in providing safe, affordable housing.[123] One problem has been that the supply of vouchers is limited with waitlists in some cities stretching for well over five years. Another issue is that the subsidy levels can be hard to match to existing market conditions. In times of rapidly rising rents, the subsidies may be too low and families with vouchers may not be able to find owners willing to rent to them, while at times of falling rents, critics contend that the federal government is overpaying for housing.[124] They may even result in a reconcentration of poverty and resegregation of neighborhoods if voucher holders have a problem finding housing in nontraditional neighborhoods (figure 7.2).[125]

Housing Quality Today

The 110 million housing units in the United States today are in better overall condition than the housing stock of the nineteenth or early twentieth century. But there continue to be issues with many units reflecting, in part, ongoing disparities related to race and income. There are also problems related to the geographical setting of many housing units.

Though almost every housing unit in the United States today has indoor plumbing, cooking facilities, and windows in every room, many houses and apartments have problems relating to structural deficiencies and maintenance. For example, a survey for the US Department of Housing and Urban Development found that about 18 percent of total units had exterior problems, 8 percent had interior water leakage, and 9 percent had blown fuses or circuit breakers. In addition, 8 percent had no working

Figure 7.2 Villa Victoria, Boston

smoke alarm and 67 percent had no carbon monoxide alarm.[126] Note that the survey found these problems to be highly related to race and income.

Other problems related to where units are physically located. Many US housing units have problems with potentially hazardous levels of radon in indoor air.[127] These levels are related, in part, to underlying geology that results in radon-contaminated water seeping into interior spaces such as basements. Other houses are in areas with relatively high burdens of outdoor air pollution. Many locally important pollution sources such as airports, highways, factories, and so on are too close to residential areas and may pose health concerns. Again, these exposures are highly related to race and income.[128] Finally, many units are in neighborhoods that are poorly designed. They may lack access to basic services or are essentially in unwalkable communities.[129]

An Assessment

The problems with public housing should not be blamed on Bauer, Wood, or the other housers who fought to create the great federal housing programs of the mid-twentieth century. As was described above, they brought to their efforts the best of intentions and they fought to educate the public about the overarching economic and social aspects of healthy

housing. Once these programs began, the financial and programmatic constraints on public housing may have been a more decisive factor. Perhaps public housing was not a failure. Though 300,000 units have been demolished, a million units have survived. And at least one observer has pointed out that demolishing public housing has been as much a function of politics as it is on the quality of the units themselves.[130]

Using our framework of health, sustainability, and equity highlights some of the problems with many twentieth-century housing programs. What was built was ultimately unhealthy and unsustainable, and many of the conventional public housing units were eventually abandoned and demolished. Poor quality housing, often afflicted with mold, unworkable appliances, and dangerous common areas, is inherently unhealthy. Poorly capitalized developments would not last the decades of useful life that they should have had. Wood had warned that housing was expensive and Bauer had predicted that it was the social aspects of housing that were responsible for its positive effects.

In 2010, there are still many government-funded affordable units including 1 million public housing units and 2 million Section 8 certificates available in a total housing stock of 110 million units.[131] In general, the United States solved its housing problem in the economic manner that Wood predicted: today most Americans earn enough to be able to afford decent housing. The great post–World War II rise in prosperity would help vastly improve housing quality in this country. After more than a century of effort, great progress in housing quality has been made. As will be seen in Chapter 10, the next great health challenge for the United States built environment will be to address the design of neighborhoods and metropolitan areas to meet a new set of health risks.

CHAPTER 8

URBAN RENEWAL AND HIGHWAY CONSTRUCTION

This chapter covers two of the large-scale national urban programs of the mid-twentieth century United States: urban renewal and highway construction. It begins with a description of perceived urban problems in the first several decades of the century and how conflicting ideas on what was best for cities all seemed to agree that dramatic measures were needed to solve growing threats to prosperity. Next is a more detailed discussion of demographic trends of this era including the ending of large-scale immigration, the out movement of the higher-income Whites to the suburbs, and the growing tide of Blacks moving into cities from the rural South. Then the chapter describes how urban planners and politicians used health metaphors to justify the need for large-scale programs.

Next, the chapter describes the federal urban renewal program and the critical role of health departments in identifying blight. It outlines the extent of displacement of residents and businesses and the lack of relocation assistance given to those forced to move. This is followed by the effects on cities of this program. Then the disproportionate racial impacts of the program are discussed along with an assessment of how individual urban renewal projects affected walkability and urban life. There is an account of the opposition to urban renewal and the health effects of the program on individuals.

The second section of this chapter describes the federal highway program, its development, and the health arguments that helped secure the passage of this large-scale change in the built environment. The chapter then discusses Robert Moses' planning ideas in the New York

Table 8.1 Key dates in urban renewal and highway construction

Event	Years
APHA Neighborhood Health Standards	1947
Federal urban renewal program authorized	1949
Large scale urban renewal funding begins	1954
National Interstate and Defense Highways Act	1956
Large scale demolition and displacement	1950s–1970s

City area and the racial impacts of highway construction. It concludes with an equity, health, and sustainability assessment of these two programs (table 8.1).

Introduction

From the trough of the nineteenth century, when urbanization and its associated problems peaked, until the beginning of the Great Depression, US cities appeared to be on a steady progress toward health and economic prosperity. Increasing incomes, new laws, and innovative architectural theories were making the design of communities better for people and commerce. Tenement conditions were slowly improving and decade by decade housing quality was rising. Then in the mid-twentieth century, a panic spread across urban America. Concerned about growing automobile traffic, accelerating demographic shifts to the suburbs, and increasing African American populations, many city administrations began to lobby for new programs to rebuild and redevelop cities.[1] Eventually, the federal and many state governments responded with a set of programs that dramatically reshaped urban America.[2]

Two programs of this era were to have important impacts on urban living because they had a large territorial extent and their effects extended far beyond the borders of individual projects. As will be seen, the urban renewal and highway construction programs used the need to protect the public's health as moral and legal justifications to set forth an enormous displacement of people. But these programs would have the opposite effect of their stated goal of promoting the public's health.

Prosperity

From the perspective of later eras, mid-twentieth-century US cities appear to have been thriving. The problems posed by rapid urbanization were being successfully mitigated through the implementation of new zoning and building codes, the construction of great water works and magnificent

urban parks systems, and the professionalization of urban planning and public health. Health conditions were improving throughout most of the first half of the twentieth century.[3]

The great epidemics were on the wane. With the exception of polio, which began to increase at this time, the impact of infectious diseases was passing; their departure prompted by better nutrition, housing, and sanitation—Antibiotics were yet to be invented and medicine as a whole was much more primitive than it is today. Life expectancy was on the increase, while infant and child mortality were dropping rapidly. Many US cities reached their population maximums between 1940 and 1950. Detroit, the automobile powerhouse of the world, appeared ready to surpass 2 million. Boston, Philadelphia, St. Louis, Baltimore, and other established cities were also at their population peaks.

Problems and a Search for Solutions

But there were growing concerns among mayors and urban theorists that traffic congestion, combined with population losses in older immigrant neighborhoods and perceived problems posed by growing Black populations, were a threat to the continued vitality of urban areas.

Urban residents were perplexed and frustrated by the problems posed by automobiles. Residents found the freedom of movement they provided addictive, but as car ownership rose, city dwellers also discovered that traffic and congestion limited their mobility.[4] There was not enough road capacity to handle all the cars, nor enough parking facilities to store them.[5]

Viewing the gridlocked streets and the financially shaky transit systems, urbanists groped for an appropriate solution to the problem of congestion.[6] Many turned to proposals to dramatically reshape the core of cities, reaching back to the large-scale rebuilding programs suggested by Baron Haussmann, Daniel Burnham, and others.[7] Also in this spirit, the Modern architects opted for the skyscraper-in-the-park approach and told mayors to completely rebuild their downtowns, channel cars to a few wide avenues, and create broad pedestrian-only zones, often spanning several blocks, in the middle of central shopping districts.[8] To a certain extent, some of these plans reflected Le Corbusier's proposal to demolish and rebuild Paris.[9]

At the same time, there were suburban architect/planners such as Frank Lloyd Wright who sought the answer to the era's urban problems in Broadacre City–inspired suburban patterns of development and called for the abandonment of cites altogether.[10] The goal was to eliminate urban form completely and suburban inspired architects and planners believed

it was necessary to demolish older neighborhoods entirely and rebuild them as models of suburban sobriety without clutter, complexity, or distractions. Wright and his followers asserted that single-family houses were superior to apartment blocks and the solution to the urban crisis was to abandon the city.[11]

Meanwhile, Lewis Mumford and the followers of the Garden City movement argued for the decentralization of cities based on English New Town ideas with industry and problematic land uses moved out of the city proper.[12] Their answers to the developing crisis were to lower densities, separate land uses, and create order from the chaos that so afflicted cities by adopting regional plans. Single-use districts, with all other land uses removed, could solve the problems of the day.[13] In this view, there was a causal pathway: density to congestion to blight to poor physical health of residents and poor financial health of cities. Or as written in *Yale Law Review*, "Congestion has created blighted areas which inevitably present grave financial problems to the city, and, more serious, cause irreparable physical and psychological injury to the human beings who must live in them."[14]

Ultimately, cities were to draw on all of these theories when they sought to rebuild themselves through urban renewal.[15]

Demographic Changes

Population shifts also alarmed city administrations. The great wave of immigration into the United States ended abruptly with the outbreak of war in Europe and the enactment of the new legislation to stop immigration. An alternative source of labor was tapped to meet the demands of capitalism: southern Blacks, disrupting the calm of White US urban area.[16] Unlike their Protestant, suburban neighbors who feared the ethnic groups that had transformed American life in the past century, big city mayors knew how to incorporate Italian, Jewish, Irish, and other European immigrants into their coalitions, trading social services and jobs for votes.[17] But native-born African Americans, moving into the urban North and Midwest, could not be so easily accommodated by traditional political-economic institutions.[18] Mayors could not hire Blacks without angering their White ethnic constituents, and, more important, could not address Blacks' single greatest need: housing.[19] However, they could not move outside overcrowded ghettos because Whites simply would not tolerate any homes being rented or purchased in their neighborhoods by Blacks and they did everything in their power, legal or illegal, to stop them.[20] Segregation and racism were pervasive and destructive in that era.[21]

As a result, mayors and other elected officials sought to devise policies and programs to keep Blacks out of White neighborhoods for most of the first two-thirds of the twentieth century.[22] Once race-based zoning was outlawed, racial covenants and deed restrictions against selling or renting to Blacks became the norm in many cities, a practice ultimately ruled to be unenforceable by the government in a 1948 Supreme Court ruling. White residents used violence to keep Blacks out of White neighborhoods, burning houses or killing people who dared to cross often imaginary lines or parish boundaries that defined the limits of the first Black ghettos.[23]

But Blacks kept arriving into cities, to work in the factories and as unskilled laborers; and as bad as the treatment was in the North, it was still better than the random violence of the lynch mob and the degrading reality of Jim Crow laws in the South.[24] In any large city, there might have been tens or hundreds of thousands or more new Black residents; and the result was extreme demographic pressure on the neighborhoods surrounding the small Black ghettos of the time.[25]

WHITE FLIGHT

In addition to the demographic pressures poised by Black residents, there was the centrifugal pull of the suburbs exerting its force on the more assimilated descendants of immigrants.[26] Boosted by growing prosperity and the availability of cheap mortgages in the suburbs, the children of immigrants were joining the movement out of cities. In particular, people with resources were moving out, and as they left, they were leaving behind the old, the less educated, and those who were not part of the postwar prosperity.[27] There was little ability to improve existing houses had families wanted to stay in the old neighborhoods because of the antiurban restrictions of FHA mortgage guidelines, which allowed banks to give loans to only single-family homes and prohibited mortgages for multifamily housing or condominiums. Unfortunately, much of the older urban housing stock was nearing the end of its useful life and needed serious repairs.[28] The result was that as people moved to the suburbs, they left behind substandard and abandoned housing.[29] Across US cities, great belts of blighted housing were forming.

There had always been inflows and outflows of population in cities. New York City, for example, had been transformed by a combination of large-scale immigration and a rise in property values. The well-to-do were displaced out of commercial districts to newer areas further uptown.[30] But the combination of an end to immigration, the general improvement in the finances of older immigrant families and their US-born descendants,

and the opening up of new housing opportunities at more distant locales had a severe effect on older neighborhoods. The population of New York's Lower East Side, for example, dropped from 530,000 in the 1910 to 250,000 in 1930.[31]

These urban problems had serious fiscal implications.[32] In an era when cities were financially responsible for the provision of social services, the mayors feared that there was an economic cost to blight. Revenues were stagnant or falling and it was no longer possible to generate the taxes necessary to keep schools, parks, and social programs funded.[33] The relentless blight, spreading from neighborhood to neighborhood, appeared to have the potential to destroy entire cities.

Concerns Increase

The housing movement had played a central role in the discussion regarding what should be done to improve tenement districts.[34] There was a longstanding tradition of housing advocates working to transform not just houses but also the conditions throughout poor areas. As early as 1920, for example, the movement for tenement house reform had morphed into a more comprehensive coalition to improve neighborhoods.[35] The idea was that to change the behavior of slum dwellers, it was necessary to change the slums. First the reformers sought to improve tenement districts building by building. But this was clearly going to be much too slow a process, so reformers gradually came to believe that there was a need to completely rebuild entire sections of cities.[36] There were other forces pulling the country toward urban renewal. In their efforts to make cities economically competitive, many mayors and downtown business leaders focused on regionalism, which sought to strengthen downtown concentrations of financial services by increasing connections between central cities and their economic hinterlands or between cities and other global financial centers.[37] Thus, cities needed large new office buildings to accommodate financial services workers in their cores and massive highways to allow workers to drive in from their suburban homes. In addition, mayors wanted their cities to be centers of tourism, learning, and entertainment, so they sought to make their communities the focus of large-scale cultural and educational institutions.[38] Against the alternative of blight and abandonment, these ambitions were to drive elected officials to advocate for large-scale urban renewal and highway building. Urban renewal offered a funding mechanism to accomplish mayors' regional and international ambitions, but as we know today, these were misguided policies. These programs ultimately served to hasten, rather than slow, much of the US urban decline in the postwar era.[39]

As the United States emerged triumphant after the defeat of the Axis powers, a consensus was building to tackle the problems in the United States' inner cities. The predicted beginnings of the great postwar suburbanization wave sparked tremendous fears that center cities would not be able to compete with the suburbs. By the late 1940s, it was clear to a growing coalition that urban issues were not confined to a few cities, they were regional and national problems.[40] The United States was in the middle of a new urban crisis. Jose Luis Sert, the dean of the Harvard Graduate School of Design, said it succinctly, "*Congestion increases*, its causes growing. *Blight spreads*, the same urban ills persisting. C*haos intensifies*[italics in original]."[41] Also at this time, the reaction to the horrors of Hiroshima and Nagasaki and the fear that the United States could end up in a cataclysmic confrontation with communist nuclear powers produced an assumption that the decentralization of the population was a crucial matter for public health. The APHA's Committee on the Hygiene of Housing stated, "At a time when dispersal of urban populations is indicated, we should do everything possible to discourage the erection of large multistory dwelling structures and office buildings."[42] In the event of a nuclear war, cities would have been prime targets, so perhaps, it was thought by some, the answer was to eliminate them altogether.[43]

Unhealthy Cities

The solution to these multiple problems was urban renewal. Using federal dollars sometimes supplemented by state and local funds, cities sought to transform themselves into modern efficient metropolises. There was a health metaphor underlying these policies: "The spread of blight will be just as fatal to the city as the spread of cancer is to the individual and the treatment must be just as thorough."[44]

The people clearing the cities were encouraged to think big and were warned that small projects would do nothing to revitalize a city.[45] Therefore, urban renewal plans had to be large scale, comprehensive, and involve as much of the city as possible. Thus Newark, New Jersey, for example, was to commit to bulldozing many of its neighborhoods in order to cure itself of blight.[46] Against these massive forces moving to rebuild cities, small neighborhoods were powerless, and urban renewal projects would soon begin to displace defenseless communities.[47]

These approaches partly grew, in part, from a public health perspective that saw the locus of urban problems in the neighborhood and the source of social and physical pathology lying in tenement districts. Reflecting these concerns, the APHA's Committee on the Hygiene of Housing published neighborhood health standards in 1947.[48] These neighborhood

criteria were consistent with the work of Clarence Perry's neighborhood unit theories, Southwood Smith's ideas on healthy housing, and Ebenezer Howard's Garden Cities ideas, among others. They were also consistent with Frank Lloyd Wright's Broadacre City. The criteria included how much land was covered by buildings; whether industrial and commercial uses were intermixed with residences; the hazards associated with streets and railroads; the adequacy of public utilities; and the availability of essential community services such as schools, transportation, parks, and playgrounds. Note that the standards represented what were perceived to be best practices and a broad consensus of what represented a healthy neighborhood: the suburban ideal. They had the aim of preventing new slums and tenement districts by promoting redevelopment that would make them more like the suburbs.

Urban Renewal Begins

The 1949 Housing Act first established federal urban renewal and its broad programmatic outlines, but it was the 1954 legislation, reflecting a consensus of big city mayors, downtown business interests, social welfare activists, housing advocates, and public health officials, that provided the funding for the large-scale redevelopment of US cities.[49] In addition, many states passed similar legislation authorizing and funding urban renewal programs of their own.

In general, the procedural steps for an urban renewal project were as given: authorize an urban renewal authority, declare an area blighted, plan new development, acquire properties, relocate residents, clear sites, and sell the land to a new developer at a reduced price or use the land for a public purpose such as a cultural facility or a sports arena. Federal and state dollars were used to front development expenses, write down land costs, and subsidize new development. Funds were used to buy properties, either from willing sellers or through eminent domain. Once the redevelopment authorities acquired title to land, there were two options to deal with dilapidated buildings: demolition or rehabilitation. Demolition was allowed as part of the initial act in 1949; rehabilitation was made an option in 1954.[50] In either case, one of the first actions once land passed into public ownership was that all the residents were forced to move out. Urban renewal needed a clean slate.

The Role of Health Departments

Many public health departments were heavily involved in urban renewal projects.[51] Most important, these health departments carried out the

house-to-house inspections that documented the extent of blight and the magnitude of the substandard housing problem. Recall that in many cities, the health department was responsible for the inspection of occupied housing as set forth in the model tenement legislation authored by Lawrence Veiller at the beginning of the century.[52] In many cities, no one besides the health department had the authority or expertise to inspect housing for blight surveys.

Even before the passage of the urban renewal acts, the APHA's Committee on the Hygiene of Housing had established guidelines for inspecting housing and neighborhoods based on the housing and neighborhood criteria it had previously developed.[53] With the statutory mandate that blight be documented, the APHA housing and neighborhood inspection guidelines were used to provide the legal justification for urban renewal areas.[54] These guidelines established protocols for declaring an area blighted, after which government had the authority to use eminent domain powers, redevelopment money, and all the other municipal powers it might have to acquire land, force residents to leave, and dispose of parcels at reduced cost to new developers.

The APHA's housing and neighborhood inspection methodology included detailed inspection forms; checklists for inspections; and procedures for tabulating results on a unit, building, block, and neighborhood basis.[55] In general, the guidelines outlined a standard of housing that promoted suburban single-family homes rather than inner-city multifamily or small one- and two-family buildings. They were almost identical to the FHA mortgage guidelines of the time, including their idealization of suburban living. The APHA standards called for minimum lot sizes of 6,000 square feet for a single-family house, for example, something that rarely existed in the older neighborhoods.

The guidelines discouraged families from living in apartment buildings and downgraded buildings that included both commercial and residential uses. While the guidelines did encourage access to public transportation, jobs, parks, and public services, they were biased against traditional urban neighborhoods because nonresidential uses were required to be apart from housing. Significantly, the standards did not condemn racial segregation; they only acknowledged that there was some evidence suggesting that segregation was bad for health and that there was a need for additional study before the APHA could take a position on the issue.[56] This was a time when discrimination against Blacks was routine and often resulted in Blacks having severe housing problems.[57]

Also important, these criteria did not include the human elements that softened city living and made it tolerable. There were no scales indicating that family and friends were nearby or that children's playmates were

next door or around the corner. They did not measure that the grocer extended credit or that families had decades of memories attached to buildings and streets.[58] The guidelines were all about measuring healthy housing and neighborhoods and did not and could not measure healthy homes and communities.[59] Nor did they value what are now seen as the benefits of urban living: walkable neighborhoods, low energy use, and diverse people and experiences.[60]

Once a declaration of blight was made, the city could move to establish a redevelopment project area, begin planning to remove residents, and ultimately displace the community.[61] There was never a strict legal definition of *blight* and since it is an ambiguous term and could mean almost anything government officials wanted it to be, by establishing its guidelines, the APHA supplied a seemingly scientific and impartial justification for declaring neighborhoods eligible for destruction.[62] These guidelines became widely adopted, and eventually about a third of US cities used either the full APHA survey methodology or a modified version of it to pronounce a neighborhood blighted. The primary reason more cities did not use the guidelines was that they were expensive and time consuming to follow. To encourage cities to use the APHA's methods, the US Public Health Service provided free trainings and the methods were published in the *American Journal of Public Health* (*AJPH*).[63]

Armed with this survey instrument, the local health department identified areas with large numbers of substandard housing and defined blighted neighborhoods. Working in concert with other city departments, they produced wall-sized maps that indicated where there should be urban renewal projects.[64] The extent of blight they found was striking. Between 40 percent and 50 percent of the total area of the United States' major cities were blighted or in danger of becoming blighted, it was claimed. Furthermore, it was declared that most of the areas slated to be cleared should never again be residential.[65] Through the use of this methodology, many inner-city neighborhoods were eventually targeted for destruction and large numbers of buildings were suddenly at risk of being demolished. But urban renewal was to be a selective tool, focusing on Black neighborhoods and often leaving other substandard, but non-Black neighborhoods, untouched.[66] The rationality of urban renewal guidelines does not explain this racial discrepancy.

Some public health advocates, along with medical officials, welcomed urban renewal as an opportunity for building new hospitals, laboratories, and research facilities in inner-city neighborhoods. It enabled universities and hospitals to cheaply acquire adjacent parcels for expansion or to rid themselves of poor neighbors who might have been a

disincentive for middle-class and wealthy patients and professionals to use their campuses.[67]

DISPLACEMENT AND DISLOCATION

The result of the blight surveys was that vast areas of Boston, New York City, Philadelphia, San Francisco, Atlanta, and other large cities were transformed by urban renewal. Many smaller cities also had projects. By the end of 1962, 636 cities had federal urban renewal projects, including 52 percent of cities between 50,000 and 100,000 in population.[68]

The scale of these projects was ambitious and the destruction of affordable housing, albeit much of it was substandard, was striking. But little replacement housing was planned or built. One analysis concluded that from "1949 to 1968, urban renewal programs resulted in the demolition of 425,000 units of housing but constructed only 122,000 units, nationwide. Most of these replacement units were for the wealthy, not the poor."[69]The effects on individual cities were enormous. For example, Gary, Indiana, planned to demolish the homes of 40,000 residents over a ten-year period, at a time when the city's total population was 178,000 and falling.[70] New York City's plans called for the removal of over 500,000 families, a greater number and percentage than those displaced in Paris by Haussmann.[71] The country was on track to displace 4,000,000 people by 1972.[72]

LACK OF RELOCATION ASSISTANCE

The displaced could not turn to redevelopment authorities to help them move, because these agencies did not provide relocation services. Even though there was no legal obligation that cities replace the housing that was demolished, urban renewal agencies were required to assist displaced residents to find new housing.[73] In theory, a displaced family could go to the urban renewal project relocation office, be offered a new home at a rent/price comparable to where they had been living before, the new home would be inspected by the health department, and, if it was approved, the family would move in.[74] In practice, few services were provided to often impoverished, displaced families.[75]

Renters, poor homeowners, and the elderly had the worst experiences. Renters were not compensated for their inconvenience and rarely did redevelopment authorities offer payments to offset moving expenses.[76] Poor homeowners did receive cash buyouts for their properties, but many remained bitter about the small amounts the government had paid for their homes. Along with Blacks, the elderly had a particularly hard time

moving out of homes and neighborhoods they had known for decades, ultimately ending up far from friends, families, and familiar landscapes.[77]

To make matters worse, the supply of potential replacement housing available on the open market to the victims of urban renewal was severely limited—Housing was in short supply in these decades after World War II.[78] Furthermore, urban renewal was not a housing production program and it usually did not include the building of new housing for low-income families.[79] On the contrary, the stated goal of the 1954 Act was to reduce the total amount of low-income housing in cities, virtually guaranteeing that displaced poor residents would have difficulty finding decent accommodations. Ironically, the justification for the public housing component of the Housing Act of 1949, which first established urban renewal, had been that there was a shortage of affordable housing.[80] But both acts only allowed new public housing construction to the extent that existing housing was eliminated, and neither came close to providing the amount of replacement housing needed. Given the long time lags between demolition and the completion of new construction, combined with the fact that urban renewal housing was rarely built for the low-income people who had been displaced, these acts increased shortages of low-income housing. Overcrowding and higher rents were some of the results of the program, adding to the misery of those displaced and the economic burden of families outside urban renewal project boundaries.[81]

Despite the need for assistance, only one half of 1 percent of total federal expenditures for urban renewal were spent on relocation services.[82] Rarely did cities even keep records on the families they were evicting. Complicity in declaring neighborhoods blighted was not the only role for public health in urban renewal. Many health departments also had responsibility for certifying that replacement housing for displaced residents met a certain minimum standard. To the extent that that the health agencies were supposed to be part of this effort, they should have noticed that there were no families being referred to them and that they were not being called upon to inspect replacement housing. But there is no record of health departments complaining they were not being called upon to inspect units for relocated families.

Effects on Cities

Over a 30-year period, roughly from 1950 to 1980, many US cities lost significant portions of their populations because of urban renewal, highway building, and other forces of the time. Though economic forces such as the movement of jobs out of cities helped fuel this loss, in part, this dramatic population loss was driven by government policy.[83] With

surrounding neighborhoods suddenly depopulated, downtown commercial districts declined.[84] Sometimes, when one neighborhood was emptied out by urban renewal, the adjacent neighborhoods underwent demographic change as the displaced moved in, pushing blight and overcrowding into new areas.[85] Job losses created by the destruction of neighborhood businesses forced many residents to leave cities to find new employment, further reducing the population.[86]

Some individual urban renewal projects may have been successful.[87] But for many cities urban renewal did not result in revival.[88] On the contrary, it left many inner-city neighborhoods and downtowns desolated. So cities began to see large tracts of empty land in their cores, sometimes cleared many decades before they were able to be redeveloped.[89] The slow pace of urban renewal, the time between when an area was declared blighted and the point at which property acquisition began, could span years or decades. Similarly, the eviction and relocation of tenants was a very slow process and then demolition could take even longer. All during these multiyear projects, conditions deteriorated for those still left in areas slated to be cleared

RACIALIZED RENEWAL

In 1962, it was estimated that about 80 percent of those displaced by urban renewal were African Americans, ranging from 60 percent in New York City to 100 percent in Baltimore.[90] Blacks were not the only victims of urban renewal. Italians and Jews were displaced in Boston and Philadelphia, Mexicans and Japanese in Los Angeles. But the racialized impact of urban renewal earned it the nickname "Negro removal."[91]

Blacks had a particularly difficult time finding replacement housing. As had been the pattern since World War I, Black migration into new neighborhoods was met by violent resistance.[92] The effects on the mostly poor African American victims of urban renewal and other government-sanctioned displacement programs were severe. Even middle-class Blacks had a hard time relocating to housing outside of existing ghettos. A study of middle-income Black households in Boston's Washington Park Urban Renewal Area found that only 4 percent of them had moved to White neighborhoods 16 months after the project began.[93] By 1969, the problem of finding replacement housing for Black families was so highly recognized that urban renewal programs were advised to establish special advisory committees to address the issue.[94] The interplay between poor Black communities, desperate for some sort of government assistance to improve poor housing but concerned they would be displaced by the very policies they were being asked to approve, and governments,

who considered neighborhood residents to be both people to be dispersed and voters who needed to be appeased, created a context where both sides sought to outmaneuver the other.[95]

While race-based zoning was prohibited, the spread of racial covenants in the mid-twentieth century constricted residential options for Blacks at the very time they were becoming an important percentage of urban populations.[96] Some Whites, who had the economic and social ability to avoid the growing chaos, moved out of cities. Sometimes Blacks, pushed out of their traditional neighborhoods yet hemmed in by violence and discrimination, would seem to quickly move into new neighborhoods, setting off new rounds of conflict, and, ultimately, White flight.[97] From the 1940s to the 1980s, the Black populations of US inner cities doubled, quintupled, or more.[98] In a few decades, many cities went from being majority White to majority African American. The non-White and the poor, trapped in declining urban centers by housing discrimination, the inability to afford suburban mortgages (when they were made available to non-Whites in the 1960s), and the reluctance of suburbs to allow the construction of multifamily housing (which would have been more affordable) drained tax bases and helped push the remaining White middle-class families out of many cities leading to the further downward spiral of city centers.[99]

The scars of these programs have persisted down across generations. Fifty years after San Francisco's Western Addition urban renewal project commenced, the ill feelings of displaced persons continued, in part because of the massive scale of the project. In July 2008, San Francisco Redevelopment Authority finally called an end to the project. What at the beginning of the program had once been the city's largest African American community with a thriving mix of stores, entertainment venues, and other Black-oriented establishments emerged from the project as "an area that has become known for its violence and is home to a number of fast-food restaurants and empty storefronts." In the process, 883 businesses were closed 4,729 households were displaced (almost none were given new replacement units), and 2,500 Victorian homes were demolished. "They wiped out our community, weakened our institutional base and never carried out their promise to bring people back," said Reverend Amos Brown of the San Francisco NAACP.[100]

Urban Renewal Projects

Many of the urban renewal projects themselves, the new office buildings, cultural centers, upscale apartment complexes, and educational and medical facilities tended to be very poorly designed. For the most part,

their architecture reflected the then current Modernist aesthetic and they shunned ornamentation, used concrete and other austere building materials, and avoided orientations toward streets or existing neighborhoods. As urbanist Jane Jacobs was to point out in 1961, these designs were antiurban and destructive of street life.[101] But the failings of the designs of urban renewal projects went beyond the imitations of Modernism. Many urban renewal projects were designed under the assumption that cities were very dangerous places and that the only way the middle-class and wealthy would visit, live in, or use the new buildings was if they were designed so as to completely wall off the surrounding city.[102] The results were underground off ramps from highways that led directly into parking garages, blank facades devoid of ground-level windows, few entryways between projects and surrounding neighborhoods, dead-end streets, pedestrian overpasses, and heavy security.[103] Notable examples include New York's Lincoln Center, Detroit's Renaissance Center, Boston's Charles River Park, and San Francisco's Embarcadero Center.

Opposition

Buffeted by opposition from potentially displaced communities and denounced by conservatives who thought government could not and should not assist cities, the federal urban renewal program collapsed in the late 1960s, though the momentum of was so great that many cities continued to have ongoing urban renewal projects well after the year 2000.[104] President Johnson scrapped urban renewal and replaced it with his Model Cities initiative, while President Nixon's signature urban program was revenue sharing.

Stung by the abuses in the first projects, the federal government began to push cities to have greater community participation and more public meetings and by the late 1960s there was a requirement that the community agree to an urban renewal project.[105] This prompted an intricate set of negotiations between the urban redevelopment authority and the community inside a proposed urban renewal project area. It was a balancing act for the city. They had to provide enough information and a sufficiently detailed plan to satisfy the federal government but not so much that a community became alarmed enough to protest.[106] Not that communities were necessarily totally against renewal—at least when the projects were beginning. A survey of residents in Akron, Ohio, for example, taken at the beginning of a renewal project, found that those with the least and most education were most opposed to the project and its required relocation, while those with a high school diploma were the most in favor.[107] Furthermore, Black community perspectives on urban renewal changed

as they become more experienced with its processes and results. African Americans in Boston welcomed the Washington Park Urban Renewal Project when it was first proposed in the late 1950s. By the end of 1960s, the reality of the project was so distressing that there was great opposition to the nearby South End Urban Renewal Project, forcing the city to completely rethink its redevelopment strategy.[108] In the 1980s, another Boston neighborhood, Dudley Street, was so adamantly against the city's attempt at urban renewal that they proposed their own alternative to revitalize their community, one that emphasized control by neighborhood residents and minimized city involvement.[109]

The Effects on Individuals

The psychological effects of urban renewal were profound. Mindy Fullilove, a community psychologist, surveying the results of Pittsburgh's urban renewal projects a decade after they were completed, coined the term "rootshock" to portray the alienation, estrangement, and isolation of former residents.[110] Herbert Gans, a sociologist, in his work on the mostly Italian and Jewish residents displaced from the West End of Boston in 1959, portrayed the sad habit of former residents of wandering around the sidewalks and cold superblocks of the replacement development, which few original residents wanted or could afford to live in, seeking solace in the memory of what once was.[111] Another study of former West End residents observed:

> But for the majority it seems quite precise to speak of their reactions as grief. These are manifest in the feelings of painful loss, the continued longing, the general depressive tone, frequent symptoms of psychological or social or somatic distress, the active work required in adapting to the altered situation, the sense of helplessness, the occasional expressions of both direct and displaced anger, and tendencies to idealize the lost place.[112]

Urban Highways

In addition to public housing and urban renewal, there was one more program that affected cities in the decades after World War II: highway construction. Though it did not have the degree of public health justification that urban renewal and public health had, the building of city highways is included here because it altered the built environment in ways that profoundly affected health.

Part of the roots of the highway program lay in the problem of traffic congestion in the cities.[113] At the end of World War I, cities began to

be flooded with cars. As early as 1920, there were concerns about auto accidents and fatalities.[114] Even in 1941, intercity railroad passenger service was inefficient, expensive, unprofitable, and only carried a fraction of car passenger miles[115] and cars were the primary American solution to transportation. Mayors and downtown business interests were convinced that congestion was bad and that cities needed to be re-engineered to accommodate automobiles.[116] Key assumptions underlying highway building were that automobile use must be encouraged and facilitated, and cities had to be rebuilt, even if this meant destroying pedestrian and transit circulation.[117]

The interstate highway program was initially supposed to avoid entering cities; its focus was on moving goods and people between regions, not around metropolitan areas.[118] But mayors and transportation advocates successfully lobbied Congress to build the interstates and their connectors into the very heart of downtown cores. The 1956 federal highway act provided for 90 percent of the cost of roads, and along with the allure of the thousands of construction jobs, this proved to be a very powerful incentive for mayors to support the program. The building of highways was seen as a way to strengthen cities and secure their primacy against the rapidly growing suburbs.[119] A major shortcoming of the legislation was that it did not provide similar incentives for the construction of subways and mass transit.[120]

Highways, along with their interchanges and ramps, consume large amounts of land and they divide neighborhoods regardless of whether they are built above, below, or at grade.[121] They pollute their surroundings and spread decay along their paths. Altogether, the physical, environmental, and health impacts of highways, which began pushing through cities just as they were being devastated by urban renewal, are profound.[122]

Robert Moses

One man who has come to be identified with many of the effects of city highway building and urban renewal is Robert Moses (1888–1981). Through his control of the Triborough Bridge Authority and other major quasi-public institutions in the greater New York City area, Moses acquired vast powers in an age when local communities had little ability to advocate for themselves against government programs. Moses and similar public works chiefs in other cities built bridges, expressways, and urban renewal projects. Moses was also personally involved in the building of Lincoln Center, thousands of acres of parks, and numerous middle-class housing developments.[123]

The effects of Moses' many projects on residents and neighborhoods were large. Robert Caro, in his book *The Power Broker*, quoted Moses as saying, "[W]hen you operate in an overbuilt metropolis, you have to cut your way through with a meat ax." Caro then went on to write, "The metaphor, like most Moses metaphors, was vivid. But it was incomplete. It expressed his philosophy, but it was not a philosophy but feelings that dictated Moses' actions. He didn't just feel that he *had* to swing a meat ax. He *loved* to swing it [italics in original]." [124]

Racial Impacts of Highway Construction

Highway building and urban renewal had a profound negative impact on Black commercial districts, and through their destruction, on the ability of Blacks to prosper and build wealth. For example, the Overtown District of Miami, once the thriving heart of that city's African American community, was gutted and destroyed by the property takings associated with the construction of an interstate.[125] Again, Blacks were not the only target. A third of Boston's Chinatown was taken for the construction of the Central Artery.[126] San Jose destroyed the former home of Cesar Chavez, along with the Sal Si Puedes barrio where it was located, to build a new highway.

By the end of the 1960s, it was becoming clear to many urbanists that building more highways into cities was not the answer to the problems affecting urban areas.[127] Highways did not solve the congestion problem, did not spark the revitalization of inner cities, and did not improve accessibility for urban residents.[128] New highways created additional traffic, a phenomenon known as induced demand, and center city problems were not reversed but intensified. If anything, the neighborhood population loss caused by highway construction more than offset any gains from increased access to suburban household consumers. One researcher estimated that each new highway into a city resulted in a loss of 15 percent of the city's population.[129] Fearful of the destruction, some communities began to turn on highways. Traffic engineers were used to the disorganized opposition of individual property owners, which they easily dismissed, but they were more taken by surprise by the organized "freeway revolts" of the 1960s and later, which stopped some highways.[130] In cities from San Francisco to Boston, a wave of activists organized themselves to keep new roads from being built through-inner city neighborhoods. In New York, the opposition to the lower Manhattan expressway was to help catapult Jane Jacobs to national prominence and eventually lead her to write a book on her alternative visions for city development.[131] But despite these few successful efforts to stop a limited number of highway projects, in most cities, the inertia toward building more highways continued well

past the year 2000. Even anticar cities such as Boston would spend billions of dollars on its massive and expensive reconstruction of its Central Artery.

AN ASSESSMENT

This book's focus on health, equity, and sustainability provides a framework for assessing the impacts of urban renewal, highway construction, and other large-scale national programs of this era. Perhaps the mid-century federal urban policies' largest failures were in the area of equity. The government reimbursed property owners, but not renters, who were poorer. Urban renewal did provide some limited replacement housing, but not nearly as much as it destroyed and what was built was mostly beyond the affordability of the people it displaced. The whole underlying premise of urban renewal was inequitable. Bringing in suburban middle- and upper-income people, either as residents of new elite housing projects or as part-time occupants of shopping malls, offices, and museum/sports facilities, does not serve the needs of the poor. In addition, the building of highways to facilitate downtown property interests came at the cost of the loss of small businesses in surrounding neighborhoods. The highways displaced and destroyed many neighborhood commercial districts.

Urban renewal and highway building were also unsustainable and unhealthy. They promoted automobile use through the construction of new highways and large automobile-accommodating development. Eventually, the new highways helped to displace the role of subways and mass transit in the United States. The direct and indirect health impacts of urban renewal and highway building were immense. To this day, the health impacts continue. As we will see, car use limits physical activity, creates pollution, and may contribute to global climate change.

Stung by the damage it helped create, city planning was to dramatically transform itself after an intense period of self-assessment over its role in urban renewal. Important texts, including Martin Anderson's *The Federal Bulldozer* and Robert Goodman's *After the Planners,* took the entire profession to task. This self-assessment resulted in new institutions and programs such as community development corporations and brownfields initiatives that rely heavily on community-based boards of directors and community-based processes to protect poor neighborhoods from public policies.

Perhaps the greatest change that urban renewal produced in the public health profession was that public health officials and practitioners withdrew almost entirely from involvement in housing and city planning for almost 30 years.[132] Community health centers, which is the public health

equivalent of community development corporations, perform tremendously important work in bringing medical services to low-income and minority communities, but most did not focus on the issues related to urban planning or on efforts to modify the built environment; instead they concentrated on the delivery of medical services. As we will read in Chapter 10, environmental justice advocates and other public health professionals were to return to the study of the built environment, followed by a renewed focus on urban planning after the growth in the obesity epidemic. That would happen in the 1990s, twenty years after some American cities began to revive.

CHAPTER 9

DECLINE AND RISE

THIS CHAPTER HIGHLIGHTS THE YEARS BETWEEN 1960 AND 1985. The chapter begins with a description of the decades-long decline in many US cities. Then it discusses the work of Jane Jacobs and how she helped spark a renewed interest in urban living and new design ideas that would eventually influence public health advocates. Next, the chapter points out the high point in demand for US suburban living and the problems with suburban development, followed by a section on the beginnings of alternatives to conventional development. Then it covers the elimination of lead from paint, followed by the transition from Modernism to Post-Modernism. This is followed by a discussion of how fears regarding crime and security shaped 1980s design.

The second part of the chapter begins with an overview of how cities began to revive, then proceeds to describe New Urbanism. This leads to an overview of new planning initiatives. The chapter then covers the developing ideas of social capital and concludes with a description of a study that looked at the effects of a view of nature on hospital patients (table 9.1).

Beginning in the 1950s and continuing for the next 30 years, many US cities failed, decayed, and almost slid into irrelevance because of demographic, economic, and social decline that seemed to be irreversible.[1] There were many causes of this decline. Some were rooted in the misguided urban renewal and highway construction programs outlined in the previous chapter. Others were related to changes in the location of manufacturing and the distribution of jobs across the United States and within metropolitan areas.[2] Others were demographic to a certain extent: the postwar baby boom prompted families to purchase single-family homes in the suburbs.[3] But collectively, the impacts were enormous.[4]

Table 9.1 Key dates in the mid-twentieth-century decline and rise of US cities

Event	Years
Jane Jacobs publishes Death and Life of Great American Cities	1961
Phase out of lead in gasoline begins	1973
First US oil crisis	1974
Lead paint banned in the United States	1978
Seaside, Florida founded	1979
Roger Ulrich publishes study on views and recovery from surgery	1984
Congress for the New Urbanism Charter adopted	1996

There were public health implications of this decline. For example, sociologists Deborah and Roderick Wallace have described how disinvestment and the deliberate withholding of vital government services in the Bronx helped spread the HIV-AIDS epidemic into other parts of New York City.[5]

JANE JACOBS

As a group, US cities did not die, however. Even as populations and investment shifted out of many cities to their suburbs, a new theory was conceived that would eventually help save many US urban areas and provide a guiding ideology to architects and planners for revitalizing neighborhoods and communities.[6] In 1961, Jane Jacobs (1916–2006) published *The Death and Life of Great American Cities,* and partly through the force of her ideas, city life in the United States was to be reborn, and eventually, the built environment and health movement was to grow. As one postmortem assessment of her accomplishment proclaimed, "Jacobs ultimately transcended her time and achieved standing as a first-order urban thinker for the ages."[7]

Jacobs was born in Scranton, Pennsylvania, and though she briefly took classes at Columbia University, she was mostly self-taught with her schooling provided by her beloved Greenwich Village.[8] Jacobs carefully observed urban conditions around her, developed fine-tuned ideas about what worked and what did not, and possessed great skills for communicating her values and ideology to others.[9] She had the passion of her convictions in everything she became involved with and lived her life in accordance with her ideals. For example, discouraged by the Vietnam War, Jacobs and her family moved to Canada in 1968.[10]

From its very first sentences, her book made it clear it aimed for radical change and that Jacobs sought to replace the principles and prevailing orthodoxies that were shaping cities in the middle of the twentieth century. The beginning reads:

> This book is an attack on current city planning and rebuilding. It is also, and mostly, an attempt to introduce new principles of city planning and rebuilding, different and even opposite from those now taught in everything from schools of architecture and planning to the Sunday supplements and women's magazine.[11]

She claimed that Modernism was intricately linked with the Garden City movement and that all the main urban theories of the mid-twentieth century could be dismissed as one all-encompassing theory Jacobs labeled "Radiant Garden City Beautiful." Jacobs' insightfulness developed from her recognizing that the fundamental value of cities was their complexity and the chaos of the juxtaposition of land uses, people, buildings, and streets.[12] In that understanding, she dismissed the concerns of generations of urban theorists including Lawrence Veiller and others, regarding the density of the tenements.[13] Her theories made efforts to separate land uses, the hallmark of zoning according to Benjamin Marsh and his allies, appear to be harmful to cities and their residents.[14] Her writings sought to demonstrate that Frank Lloyd Wright's Broadacre City and Le Corbusier's Radiant City were sterile urban alternatives.[15] Since built environment advocates propose that vibrant streetscapes promote health, Jacobs' ideas are of extreme interest to this history.

In the book, Jacobs puts forth the proposition that city sidewalks were meant to promote public safety, provide the forum for social interaction, and be the central place for the raising and socialization of children. She turned inside out the idea of the city park, thought by tenement reformers to be an essential service to overloaded neighborhoods that provided places where children could play and adults could get physical activity and reconnect to nature, into a construct that was dependent on the surrounding community for safety and use. Therefore, she declared, parks must be kept small, open to passersby, and guarded against undesirables. Thus Frederick Law Olmsted's dominant voice on the uses of urban parks was challenged. Most important, Jacobs advocated for a fine-grained texture of development and land uses. She opposed all large-scale development and was especially against urban renewal.[16] Therefore, two generations after it was first proclaimed in Chicago, Daniel Burnham's exhortation to make no small plans was counterbalanced.[17] She wanted densely packed buildings fronting onto streets and with that goal, garden cities were obsolete. Also important, she wanted urban forms, not suburban patterns of development. This was very much the opposite of the guidelines adopted by the FHA, the APHA, and others, which called for housing setback from streets; prohibitions on mixing land uses; and broad green spaces, also set back from the street, where children could play.[18] An alternative to Frank

Lloyd Wright's suburbia and Le Corbusier's Modernism had arrived. The century-long quest for order and simplicity of urban form that had been a major goal of zoning and tenement reform was now replaced by a priority on randomness and complexity. A central theme of her book was that dullness causes blight and dullness is blight.[19]

Today, Jacobs' theories continue to have a strong influence on the built environment movement. Regardless of how accurate her observations were, as we will see in Chapter 10, her writings have heavily influenced public health and have become widely accepted among those who are working to modify the built environment to improve health. They influenced Andres Duany and the other New Urbanists, who as we shall see, are a major force in designing cities in our time. Whenever there is a discussion of building mixed-use development, increasing density, and building a finer-grained texture of buildings and land uses, the ideas go back, at least in part, to Jacobs.

Jacobs was not without her critics. Lewis Mumford savaged Jacobs' book in an extended review in *The New Yorker* that put her down with the title *Mother Jacobs' Home Remedies.* He claimed that she was obsessed with crime and he noted that in her overarching fear of violence, she mobilized all urban form to participate in the fight against criminals with every building and every person enlisted in the effort to make city streets safe. This overwhelming concern for safety led her to advocate for mid-rise buildings, with walkups not elevators that were set close to the street with stores on the first floor of every building and multiple uses so that the streets would always be crowded. Every building had to be sited so that its occupant's eyes could observe what was happening on the sidewalks.

Mumford shared her concern about crime, but thought its causes were rooted in the congestion and density of the city that caused mental illness and social pathology. Therefore, he came to opposite conclusions on what should be the ideal safe urban design. He held that the solutions to crime were superblocks and the sharp separation of land uses, preventative measures that sprang from a combination of Modernist and Garden City theories—ideas that Jacobs saw as mirror images of each other. That crime might have a social genesis and be best solved by addressing poverty, and the racial prejudice of the era did not occur to either of them. Mumford was also disturbed by Jacobs' lack of concern for aesthetics and pondered what would she think of Florence, Venice, or other European cities. He was especially critical that she wanted everything on every block; each was to have its own stores, parks, housing, offices, and other land uses. Mumford pointed out that perhaps it would be best to have a mixture of streets, some with commercial uses on their first floors and others entirely residential, a pattern of development which Jacobs specifically condemned.[20]

The *Village Voice* was only slightly kinder in its book review. While it admired her ability to stand up to the forces pushing for the remake of Manhattan, it found her difficult to understand. Rather than analyzing her ideas, the article focused on her stubborn temperament, her unwillingness to compromise, and her inability to concede the legitimacy of any opinion but her own. The diminutive Jacobs was made to appear as a force as irresistible as that of her giant foe, Robert Moses.[21]

Jacobs failed to influence many of the academicians of the early 1960s. Many sociologists were moving away from environmental determinism, the idea that the features of neighborhoods or housing were responsible for crime and poverty. Some focused instead on how the behaviors of the poor were self-defeating and poised them to perpetuate their poverty over their lifetimes and across generations.[22] These ideas came out of the important ethnographic studies of the era, which included work by Oscar Lewis, Herbert Gans, and others, and ultimately led to the idea of a "culture of poverty" that was to drive US social policy for most of the last four decades of the twentieth century. Many sociologists had come to believe that the built environment did not create behaviors; it could only foster or encourage them.[23] Therefore, the key to changing these behaviors lay in manipulating the social environment so that poor people were not concentrated with other poor people but were instead exposed on a daily basis to middle-class working families.[24] Through observing successful living and working habits, the poor could learn how to behave as the middle class did. In contrast, the theory went, changing the built environment would have little influence on antisocial behavior.[25]

For most of the 1960s, many architects remained firmly in the grasp of late Modernism, though the movement was in its last decades. Meanwhile, public health as a whole had been withdrawn from the debate over the built environment altogether.[26] Environmental health advocates' attention was more focused on the other influential book of this time, Rachel Carson's *Silent Spring,* and public health was beginning its long and important advocacy for a cleaner environment. The new growth of environmental health was to be in the fields of toxicology and pollution effects on human organisms, plants and animals, and ecosystems, rather than efforts that could improve cities and urban health. [27]

Suburban Zenith

Jacobs' ideas slowly spread among architects and planners, taking years to become a transforming ideology of urban planning. Meanwhile, the suburban alternative to urban living was moving toward a crest in popularity. As has been seen, the movement to the suburbs had begun decades before Jacobs published her book.

Even during the early 1940s, there were critical concerns about the effects of the car-centric suburb and its development of social isolation. Suburbs represented a shift from community to the individual, from the public to the private.[28] Thus there was an impersonal element to the new freeway-based society. The human scale was missing and people no longer could be found walking along streets; humanity was about to become subservient to the machine, the automobile. However, while many theorists, architects, and intellectuals were concerned about the quality of life in US suburbs, for most of the general public, the suburban lifestyle was generally unquestioned.[29]

At the time, suburban planning tended to focus on environmental health, narrowly defined. The social environment was not considered and the prevailing norms of the built environment were not questioned.[30] Perhaps this was the final result of the split between the disciplines of public health and planning. As will be seen in the next chapter, for the most part there were new medical research or health ideas that would seek to inform urban planning until the 1990s.

This did not mean that planners, engineers, and architects stopped taking measures to protect health. For example, the design of highways, where pedestrians were prohibited, was seen as a way of protecting people from harm.[31] Lower densities and spread-out buildings were perceived as reducing congestion and automobile traffic.[32] The development of dendritic (lollipop) street designs minimized traffic hazards, while the superblock reduced the danger of accidents, or at least confined them to the few roads and intersections that remained.[33] While we now understand the unintended consequences of these regulations, the new guidelines also promoted neighborhood parks and citizen participation in planning and development, and made sure that the new suburban developments were not peripheral slums.[34] The result, as will be seen, was to be the obesogenic suburb, communities so highly engineered for cars that they inhibit physical activity and promote obesity.[35] But that was only understood in the future.

By the late 1970s, one of the remaining connections between public health and land use planning was focused on implementing new environmental laws passed in the aftermath of the first Earth Day. Both professions were concerned with clean air, clean water, and the reduction of exposures to hazardous wastes.[36] They sometimes would work together on addressing industrial pollution; sometimes they were called to cooperate on the cleanup of contaminated sites.[37] Septic system controls were another area of overlap, a concern the two professions had shared since the time of the sanitarians in the nineteenth century.[38]

The Problems with Conventional Suburban Development

A number of theorists slowly began to solidify the opposition to suburban living. Dating back to Southwood Smith's time in the 1830s, there was a longstanding accepted set of concerns regarding the problems of city living, but the problems with the suburbs took longer to be identified. The term *sprawl* was first used at least as far back as 1937 and many of the impacts of suburbanization were beginning to be discussed by the end of World War II:[39] drained tax bases of center cities, concentration of the poor and non-White in urban ghettos, poor zoning and building controls in certain suburbs, contamination of ground water from suburban septic systems, and lack of infrastructure to handle new growth.[40] However, the negative direct health implications of suburbanization were not to be documented until public health began to take notice of the suburbs and re-engage with the built environment at the end of the 1990s.

Beyond health concerns, classic arguments against suburban development, which were mostly fully developed by the mid- to late 1970, rested on environmental, aesthetic, and social grounds. The environmental impacts include problems associated with air, water, land consumption, and energy use.[41]

Even in the absence of direct public health involvement in architecture and planning, the environmental consequences of cars were becoming well understood. Suburban development is by necessity car dependent, and therefore it directly results in air pollution associated with cars, buses, and trucks: ozone, oxides of nitrogen, sulfur dioxide, volatile organic compounds, particulates, and, at one time, lead.[42] The health effects of these pollutants are well documented and they serve as the legal foundation of air pollution laws that date back to the 1970s. Air pollution can cause heart disease and cancer, exacerbate asthma and other respiratory diseases, and is associated with lower life expectancy, sudden death, and other morbidity and mortality effects.[43] Later, scientists have come to understand the tremendous potential problem of greenhouse gas-induced global warming. The US transportation sector produces about 10 percent of the total worldwide carbon dioxide put out into the atmosphere each year.[44] Given that automobile use is in part a function of land use, the contribution of the built environment to the problems posed by global climate change is important.[45]

The vast surface area of streets that must be constructed to accommodate suburban development also has effects on water quality, causing increased runoff during heavy rains; exacerbating flooding; and carrying contaminants from the streets, oils, animal feces, and other pollutants,

into rivers, lakes, aquifers, and bays.[46] Since the successful clean up of many sewer discharges by the Clean Water Act, these "non-point" pollution sources represent one of the greatest threat to water quality.[47] Many suburban developments, particularly in the eastern half of the country, rely on septic systems because their low densities make sewers uneconomical, and these systems can also contaminate aquifers and surface waters, just as they contaminated city drinking water in the nineteenth century.[48] This is another link between the built environment and health.

Many mid-twentieth-century critics held that the suburban experience was isolating and dehumanizing, causing residents to be more prone to depression and other mental illnesses.[49] Compared with cities where there were always other people around, the suburban individual or family would have little contact with other people except in certain carefully managed places: malls, schools, and worksites. Suburban residents would also be less creative and less open to new experiences.[50] At the time these theories were developed in the mid-1960s, there was little evidence to support them and for the most part they were based on the limited observations and broad assumptions of the theorists. It was only later that social science research began to study the social relations of urban versus suburban residents. However, there are still not a sufficient number of studies to decide these arguments.[51]

Notably absent from these mid-twentieth-century criticisms were health assessments. Again, as we will see in the next chapter, public health would not return to the field of the built environment until the late 1990s.

New Planning Initiatives

Perhaps to the public, it appeared that conventional development guidelines were unchallenged, but slowly, concern with them began to spread among academics and urban planners.[52] In the decades after her book was published, Jacobs' ideas grew to dominate US planning and architecture schools, and architects and planners began to envision new projects based on her theories, but often they were stymied by the strictures posed by conventional zoning.[53] In part, there was a practical reason behind the inflexibility of the codes. Conventional zoning tended to have two objectives: separating land uses and reducing density.[54] Most important to the conventionalists, who dominated municipal planning departments from World War II at least through the end of the 1970s and still control many planning departments today, was the need to repress any developer attempt to increase a property's density. This restriction on development was necessary because reducing density was one of the few tools that cities had to control automobile congestion.[55] They could not build mass transit

to mitigate the effects of density, because few cities had the resources or desire to build or expand their systems and the federal government was mostly funding highways. Pedestrian connections were not a viable alternative because the large-scale separation of land uses meant that planners could not guarantee that walking to destinations was possible. Therefore, cars were the only way to move people around a metropolitan area and planners had to maximize the utility of car use.[56] But this quickly led to traffic problems, so planners had to reduce the scale of development in the hope of reducing the numbers of cars on the roads. The problem, however, with using lowered densities to control traffic congestion is that it does not work. People still have a need and desire to access a multitude of locations and lower density simply means that while the traffic inside any one development might be reduced, the overall level of traffic on highways, collector roads, and major arterials is increased.[57]

The Elimination of Lead in Paint and Gasoline

The case of exposure to lead was an important exception to this general trend of public health's lack of involvement with the built environment. The health effects of lead were first described in ancient Rome, and other countries banned lead paint in the 1920s, but the United States did not begin to eliminate lead from household environments until the 1970s after the first comprehensive studies on the cognitive effects of lead on children were published.[58] Since that time, there has been a steady lowering of what is considered an actionable level of lead in the blood and the blood lead level that is considered high today is actually lower than what was the mean blood level in the 1970s before lead in gasoline was banned. There is no safe level of lead and the ideal exposure is zero because lead is a neurotoxin and has other negative health impacts.[59] The most at risk are children, particularly those who are from low-income and minority families, but anyone can suffer health problems if their blood lead level is high enough. There were two important environmental health regulations that have resulted in this tremendous decline in lead exposures in the United States and the reduction of mean blood lead levels from over 18 micrograms per cubic deciliter in the early 1970s to less than four today.[60]

These two great public health advances occurred in the 1970s. One was the elimination of lead from gasoline, immensely important, but beyond the scope of this book. The other great advance was that in 1978, lead was banned from paint.[61] Lead had been used in paint because it had a brilliance that did not decline over time, but paint almost inevitably flakes as it ages and lead is released into the houses and yards of older buildings that are in disrepair—the houses of the poor. And because African

American children are most likely to live in these units, they are most at risk for lead poisoning.[62] In some of these houses, lead is an important component of dust. Lead paint flaking off exterior walls can contaminate the soil around houses and then be tracked back inside, or poison children who play outside or eat vegetables grown in these yards.[63] Hand to mouth behaviors are normal for very young children, and children who are at the age when they are crawling and first walking—touching everything in their environment and putting everything, including their hands, into their mouths—are at most risk for lead poisoning.[64] The ultimate solution to the lead paint problem is deleading, a process that is expensive and is best left to professionals.[65]

Post-Modernist Architecture

As the suburbanization movement accelerated over the 1970s, architectural practice began to change.[66] By 1980, the Modern Architecture movement was about to reach its end of its dominance and be replaced by Post-Modernism. Though it includes a broader mix of idioms than Modernism, there are some overarching themes in Post-Modernism. Where Modernism aimed for a serene whole, many Post-Modernist buildings tended to be purposely ironic with the juxtaposition of many different styles, often thriving on the contradiction this produced.[67] In addition, it encouraged ornamentation; but along with throwing off the old Corbusian austerity, Post-Modernism also shed Modernism's front and center emphasis on social justice goals.[68] These were not abandoned completely and many architects continue to be motivated by a strong desire to better humanity and continue to seek ways to design healthy, livable buildings and communities.[69] It is just that these goals are not as broadly showcased as they were in the previous movement.

Architects began to design buildings with facades that ranged from measured repetition of classical elements to building faces that attacked the two dimensionality of the building plain itself.[70] Some Post-Modernists, such as Frank Gehry, made a career out of breaking the flat facade of Modernism into curves and multiple pieces.[71] There were controversies as Modernism gave way. For example, when Phillip Johnson's ATT (now SONY) Building opened in 1984, its Chippendale-like pediment that resembles a grandfather clock met with mixed critical reception.[72]

Crime and Security

Another force in architecture during the latter part of the twentieth century has been a concern for security.[73] National crime rates peaked in the

1990s with a parallel increase and decrease in many individual cities.[74] In many areas, developers and planners turned to the gated community, a privatized protected enclave with limited access.[75] The concern is that these communities may limit walkability as well as have negative impacts on the poor who cannot afford to live in them.[76] But the full impacts of these types of communities have yet to be studied.[77]

The fear of crime in cities continues to be cited as an important motive for suburban living.[78] But this may not be reflecting the actual relative safety problems in cities. A 2003 study found that the risk of dying by being murdered by an unknown assailant in inner cities was less than the risk of dying of a traffic accident in the suburbs. Furthermore, the risk of dying in motor vehicle accidents increased as one moved from the suburbs to the exurbs.[79] However, even as urban crime rates declined after 1990, there was little evidence to suggest that this was causing a reconsideration in intrametropolitan area residential movement.[80]

Up from the Bottom

The rise in crime, the loss of population, and the social and economic distress of inner cities made it appear that the time of urban living in the United States was in a fatal tailspin at the end of the 1960s.[81] But while some cities have continued their decline with decay seeping out of the center cities themselves into the surrounding ring of suburbs, or in the case of Buffalo and a few other cities, to entire metropolitan regions, it may have been in the 1970s that urban life in the United States reached its nadir.[82] Many cities have continued to decline—Detroit, St. Louis, Baltimore, and Cleveland now have barely half the population they had at their peaks, and the decline may be nearly impossible to stop.[83] But other cities reached a population low point in the 1970s, but have since rebounded, including New York, San Francisco, and Boston.[84] Still other cities, particularly the newer Sunbelt cities such as Phoenix, San Jose, and Houston, never lost population and have continued to grow decade after decade.[85] Overall, the center city population in the United States has stabilized with about 30 percent of the total population of the country. But the results are uneven, with some cities growing and others declining. Similarly, the rural share of the US population is stable at about 20 percent, but again, this masks uneven growth and decline with much of the high plains region losing population and most of the rural growth occurring at the fringes of metropolitan areas. The suburban share of the US population is also stable, with just over 50 percent of the population. This also masks uneven trends in various locations. Many, but not all suburbs are stable or growing; others, often almost indistinguishable from inner-city neighborhoods, are losing population. Overall,

US cities are not in a death spiral, while some continue to decline, others are thriving.

The revival of US cities in the 1980s was made possible, in part, by a new set of design programs inspired by Jacobs.[86] The rigidity of conventional codes clashed with the ideas derived from Jacobs' version of urban living, so dissatisfaction with mainstream development in both cities and suburbs prompted a number of architects and planners to develop new design forms. Architects and planners used the flexibility provided by planned unit development or created alternative codes and design guidelines that could be used to build dramatically developments different than those permitted by conventional zoning. These innovations were produced because Jacobs' ideas and the new planning theories developed by others finally began to counteract the strictness of conventional design guidelines. Some of these new forms focus on individual buildings and small-scale developments. Other architects and planners have worked at the scale of the neighborhood, designing projects covering up to hundreds of acres. Finally, there have been a number of policy initiatives, arising more from the urban planning field than from architecture, which have attempted to address the overall design of metropolitan areas. Many of these design types and policy initiatives are interrelated, but it is rare that any one program or policy includes them all.

New Urbanism

One of the new architectural and urban planning movements that is heavily influenced by Jacobs is New Urbanism. The movement warrants a detailed description here not because of any great superiority of its design features (some might argue that its designs are important, others against them) but rather because it was to highly influence the new public health and the built environment movement that developed at the beginning of the twenty-first century. As will be seen in the next chapter, when public health researchers started to turn their attention to the built environment because of the rise of the obesity epidemic, New Urbanism was at a crest of influence and it appeared to offer healthier alternatives to conventional development. It was at the right place at the right time.

New Urbanism very consciously derives its ideas from Jacobs and a New Urbanist design typically features mixed uses, at least some housing over stores and offices, small lots of attached or semidetached housing, a variety of housing styles, fine-grained development, higher densities, and pedestrian amenities.[87] A major influence in the development of New Urbanism was a discontent with the lack of a human element in conventional planning and urban design.[88] New Urbanism was first and foremost

a desire to return to what was seen as a more traditional, precode type of development that would allow neighborhoods that Jacobs had promoted. There was also dissatisfaction with the lack of choice inherent in these national codes; everyone was forced to live in the same type of development whether they lived in Maine or California because few alternative types of development were allowed by the old codes.

One of the earliest and most influential of these New Urbanist projects was Seaside, a mostly residential development covering 80 acres on the Gulf of Mexico. Robert Davis, the developer, had inherited the land from his grandfather and originally, his plans called for a holiday camp, then a university-sponsored retreat and conference center. Davis wanted something different, so he hired Andres Duany and Elizabeth Plater-Zybeck, who used what looked like traditional small town vernacular architecture in a mix of housing types. On the one hand, Seaside's design guidelines are remarkably relaxed, focusing on encouraging a balance between community rules and individual expression. But on the other hand, according to one analysis, "Seaside's master plan is as inflexible, at times, as any staid and less meticulously controlled suburb in North America."[89] The architects left nothing to chance in designing their residential village. While allowing variety in individual houses, they insisted that every detail support their overall plan.

The New Urbanists used their experiences in developing neighborhoods to reorder the traditional view of the organization of a metropolitan area, a series of transitional zones around a downturn core, into the form of a transect. The New Urbanist model came from ecological theory. The natural transect, developed by Alexander Von Humboldt in the eighteenth century, is a cross-section of geographic/geologic/ecological zones from the shoreline to the mountain tops. In a similar sense, a metropolitan area can be seen as a spectrum of uses: from downtown, to smaller centers, to residential districts and industrial areas.[90] From this perspective, the transect simply places this hierarchy into linear space, allowing each use to find its proper distance from the center. The urban transect created by New Urbanists and smart growth advocates sets forth six zones ranging from dense inner cities to wilderness areas. It then articulates a set of principles to guide the final outcome of development appropriate to each of these zones.[91] The New Urbanists did not treat their zones as necessarily transitioning from one type to another; instead they saw them as potentially static and naturally reflective of the place of a community inside the larger metropolis. Rather than having to address the issues of resisting or abetting transitions, New Urbanists are free to harness the energy that comes from the inherent diversity in each zone. In the New Urbanist city, there are tensions between order and diversity,

density and development,[92] but instead of being disturbed by this in the way that Mumford and older urban critics were, the New Urbanists were energized.

Duany and other like-minded designers, planners, and architects founded the Congress for the New Urbanism (CNU) to advance these new kinds of designs. Consciously drawing its inspiration from the Modernist Athens Charter of 1933, just as CNU itself was inspired by the Athens Charter's parent organization, *Congrès internationaux d'architecture moderne* – *CIAM* (International Congresses of Modern Architecture),[93] CNU produced its own Charter, outlining its guiding principles and philosophy in 1996. While the Charter's preamble mentions environmental health, it appears that it is referring to ecosystem not human health. And while developments designed in harmony with the Charter might be health promoting, health itself is not mentioned in any of the Charter's 27 points.[94] Thus, there was no explicit health goals at the time the movement was established. These were to come later when public health adopted New Urbanism goals as its own.

New Urbanism and its related development types are known as form-based codes; they are prescriptive and contextual rather than being remote and fixed as are conventional building and zoning codes.[95] The New Urbanists use their alternative code to produce an ordered version of chaos, just as Olmsted built a version of wilderness constrained by humans in his parks. The New Urbanists use a combination of the transect and their building guidelines to create a series of public spaces and interactions between buildings, blocks, and streets where each reflects the values of the others in independent ways.[96] However, even as it seeks to create a current aesthetic, New Urbanism is derived from a very conscious effort to re-create a very sanitized past. It grew out of the historic preservation movement and dissatisfaction with other patterns of postwar development that overly valued order, calm, and conformity. In contrast, New Urbanism results in the rebuilding and revitalizing of communities, providing spatial coherence and cohesion of neighborhoods through complexity, prioritizing of the public over the private realm, and paying greater attention to environmental and other concerns.[97] Some evidence suggests that New Urbanist developments foster higher levels of social cohesion and community interaction.[98]

On a smaller scale, architects and planners have come to promote mixed-use development. In a sense, this has become more acceptable because of the change in the US economy over the past 50 years. When planners and architects envisioned mixed use after the year 2000, they did not mean homes adjacent to slaughterhouses such as was commonplace in Chicago in the 1890s or apartments with loft factories as in New York

City in 1910.[99] Today, mixed-use development means placing apartments above doctor's offices, clothing boutiques, or other environmentally neutral land uses. Traditional zoning and development forces people to drive by limiting densities, requiring single uses, and using street and parking requirements that make walking dangerous, difficult, or impractical.[100] New Urbanist designs result in an increased potential range of community types and they promote walking by limiting parking, creating streets safe for pedestrians, making streetscapes interesting, and placing diverse destinations within walking distances of housing.

New Urbanist developments are rarely larger than a series of neighborhoods clustered around a modest commercial area and some are as small as single buildings. In addition, there are affordability problems in many of these developments and except for the public housing projects, many developments are not integrated internally or externally but remain mostly for higher-income families and without people of color.[101] Though there have been some urban projects, most notably the HOPE VI redevelopments that transformed many old conventional public housing projects across the United States into mixed-use and mixed-income development, most New Urbanist projects are in the suburbs. As such, they suffer from the same contextual problems of more conventional suburban developments: they are only accessible by car, they do not connect to surrounding communities, and they lack a critical mass to be self-sustaining. This had led the architectural critic Vincent Scully to suggest the movement should be called the new suburbanism (figure 9.1).[102]

New Urbanism has strongly stated social goals and its design standards seek to maximize community as well as physical outcomes.[103] The discourse over what is the best way to develop communities is far from over. Some prosprawl people have made the arguments that antisprawl measures would result in government dictating where people might live, resulting in the end of home ownership and the destruction of property rights.[104] Critics of New Urbanism have raised concerns regarding empirical performance (cost, trip reductions, affordability), ideological and cultural grounds (preferences for suburban living, antiurbanism), and on aesthetics (false landscapes).[105] They maintain that consumers prefer sprawl. Some critics also oppose New Urbanism's cousin, smart growth, because they believe it increases regulation.[106] Finally, some argue that smart growth reduces affordability, even though its higher densities reduce per unit land costs. One analysis of these criticism suggests that they have tended to use exaggeration of single case reports rather than detailed peer-reviewed scientifically framed studies.[107] Others point out that form-based codes are less restrictive than conventional zoning; it is the nature of their underlying assumptions that have changed.[108] Furthermore, high

Figure 9.1 Orchard gardens, Boston

prices might be indicative of higher consumer demand and for these developments as well as increased amenities.[109]

Despite attacks, New Urbanism has grown to become a major alternative to conventional codes and development. The conventionalists may still dominate the landscape, but inside many cities and in some of the denser parts of the suburbs, New Urbanist ideas provide some of the guiding philosophy for new development, even if sometimes their language is more spoken than observed. These have inspired a number of related types of development, including transit-oriented development and traditional neighborhood development, which sometimes use New Urbanist ideas, even if they don't always use the name.

NEW URBAN PLANNING TOOLS

New Urbanism is not the only idea that claims Jacobs as an influence, nor was it the only late twentieth-century planning/architecture movement that was to influence public health researchers. In addition, some urban planning policies have also tried to shape how metropolitan areas are developed in order to promote inner-city living and promote health. Planners concerned by consequences of urban sprawl began to propose ways to limit growth.[110] Such policies and programs can take many different

forms and operate on different government levels. Sometimes individual cities will impose growth limits; other times they are developed on the county or state level, though their implementation can still be assigned to local jurisdictions.[111] The tools themselves vary. One method is the growth boundary.[112] A line is drawn around a metropolitan area and cities cannot annex land or approve new subdivisions outside the limit. Less used, because of its cost, is the greenbelt, which consists of a ring of parks, farms, or open space where development is prohibited or severely limited.[113] Usually, public money is used to purchase land or development rights at the periphery of a metropolitan area, but given that vast tracts of land must be purchased, many jurisdictions can afford this and often greenbelt-like growth restrictions have been accidents of geography, such as the natural limits imposed by the Everglades' proximity to the Miami-Ft. Lauderdale area or the mountains that surround San Jose, California. Portland, Oregon, is one of the largest successful example of a growth limit that was developed and implemented without geographic boundaries to reinforce it.[114] Other tools that jurisdictions have used to limit or stop growth include large lot zoning (subdivision ordinances that limit lots to a minimum of ten acres or more which effectively stop conventional suburbs but can still result in a thin spread of large mansions across the landscape), caps on building permits, or limits on sewer and water connections (perhaps practical only in semiarid or arid areas).

A more comprehensive program is called smart growth, again, perhaps most famously adopted in Portland, Oregon, in conjunction with its growth limit boundary.[115] Smart growth uses a metropolitan-wide set of policies to guide growth away from the periphery and back toward portions of the region where there is existing infrastructure and need for more growth. It has been promoted by Smart Growth America, a nonprofit organization that has done a great amount of work to promote reduced sprawl through advocacy, training, and promoting research, including studies of the health effects of the built environment. Like New Urbanism and many contemporary design trends, smart growth focuses on outcomes, not proscriptive codes, and aims to change the overall texture of a metropolitan area, both its individual blocks and the ways that its various communities are related to each other. It is based on an understanding that metropolitan areas are comprehensive wholes, and therefore they must be planned comprehensively. Thus smart growth represents the next step forward from the earlier sustainability movement from which it sprang. It arose from a desire to be proactive and to positively shape the future and an optimism that new development can be less environmentally disruptive and can produce a better quality of life than it has in the past.[116]

Growth controls have been attacked as being irrelevant or destructive. A much quoted study by Edward Glaeser and Joseph Gyourko suggests that it is government regulation that is responsible for the unaffordability of housing in certain metropolitan areas.[117] On the other hand, there have also been suggestions that urban containment policies actually reduce racial segregation by refocusing development activities to disadvantaged areas and by increasing accessibility of environmental, physical, and social amenities. At least one study appears to support this.[118] But anti-mass transit and prosprawl enthusiasts have argued that the solution to spatial mismatch is to simply subsidize the automobile commuting costs of low-income inner-city households. However, because the social, economic, and environmental costs of sprawl are so much greater than just the costs of automobile ownership itself, these subsidies would ultimately fail to make inner-city residents whole.[119] Prosprawl advocates argue that growth controls limit new construction, particularly rental housing. This leads to impacts on low-income and minority households.[120] But many comprehensive growth restriction plans contain sections promoting multifamily development.

The debate between prosprawl and antisprawl advocates still continues. Prosprawl advocates argue that Air is getting cleaner despite increased automobile use, improvements that began before the onset of federal regulations; more food is being grown on less land because of efficiencies in agriculture and therefore land is not in short supply; suburb to suburb commuting and lower densities reduce congestion by allowing people to live closer to their jobs; inner-city poverty is not caused by suburbanized development but is the result of other factors; high residential densities do not reduce infrastructure costs; social interactions in the suburbs are not lower than in the cities; mass transit does not reduce traffic congestion; and downtown revival is exaggerated.[121] However, smart growth and antisprawl proponents counter that cars only became clean because of government regulation, agriculture is at the limits of its efficiencies, congestion is increasing, spatial mismatch leads to inner-city poverty and impoverished inner-city communities, inner-city and infill development reduce infrastructure costs and eliminate the need for vast subsidies for suburban development, mass transit is and should be a central part of a strategy to address congestion, cars produce global warming, and many downtowns are reviving and would revive more if infill development was promoted.[122]

Despite efforts to slow suburbanization, the reality is that the past 50 years of decentralization have dramatically reshaped US metropolitan areas.[123] The United States has few metropolitan-level governments, and political scientists have sought to devise alternatives to the current system

of fragmented government. In an old model of concentric rings of development, the entire metropolitan area was dominated by the core. Today, cities tend to be multicentric with multiple centers of density and activity while a downtown is just one center among many.[124] The response to this geographic shift has been divided. Some advocate for metropolitan government; others want to devolve power down to the neighborhood.[125] A handful of jurisdictions have consolidated their governments: Miami-Dade and Nashville-Davidson are the most famous, but for the most part, metropolitan-wide government is rare in the United States.

Social Capital

New Urbanism has a strong set of social objectives, with the goal of promoting feelings of community and neighborhood. Similarly, sociologists have returned to the study of urban form to contribute to the growing literature about cities and other issues through the concept of social capital.[126] One of its most prominent theorists is Robert Putnam, whose book *Bowling Alone* captured the imagination of New Urbanists and urban health advocates when it was published in 2001.[127] Social capital is a function of relationship of an individual to his or her community. Or as one definition has declared:

> In a way both compact and capacious, the concept of social capital boils down to networks, norms, and trust. Upon inspection, networks prove dense and valuable, norms pervade individual actions and social relations, and trust appears psychologically complex.[128]

Social capital is a construct that includes the degree to which an individual is situated inside a network of family and social relations, the degree to which his or her actions and behaviors are consistent with that network, and the degree to which the individual feels that he or she can rely on that network to provide a safe and nurturing environment as well as meet external threats.[129] New Urbanists value social capital because they believe it describes the strengths that were part of their idealized small-town America. They argue that New Urbanist developments promote greater social capital while more typical postwar development has worked to destroy it. Many health advocates promote social capital, and therefore support New Urbanism, because they believe that persons and communities with greater levels of social capital are healthier.[130] Evidence suggests that persons who have higher levels of social capital tend to have fewer chronic conditions, tend to have lower mortality risks, and are more resilient when disaster or health crises threaten.[131]

A concept related to social capital is that of "broken windows," or the theory that neighborhood conditions influence individual behavior. Promoted by James Q. Wilson and his colleagues, broken windows theory maintains that people take clues on what is permissible behavior based on their surroundings. If people see broken windows, graffiti, and other signs of disorder, they relax their internal controls against similar antisocial behavior and feel more inclined to commit crimes or engage in other undesirable activities.[132] Therefore, small signs of decline or disorder can lead to an amplification of distress and antisocial behavior and set a neighborhood on a downward spiral. There are health implications of the theory; one study found that higher levels of neighborhood disorder are associated with increased risk of gonorrhea infections, for example.[133] A problem with this theory, however, is that perceptions can be subjective. As poverty and percent of Blacks in a neighborhood increase, for example, so do perceptions of disorder, even independent of objectively measured disorder.[134] So a question is whether disorder or prejudice is driving behavior.

VIEW OF NATURE AND HEALTH

One influential line of research emerged at the end of this era regarding the influence of nature on health. There has been a longstanding opinion on the part of many that cities are unnatural and that there is something fundamentally wrong with urban living and the disconnect between modern life and the natural world. For example, even as early as 1916 it was written, "It would be a matter for wonder if the ordinary city child did possess any particular knowledge of how his food is produced or where it comes from, other than the corner grocery and brought by the delivery van."[135] Perhaps the most cited research that supports the idea that city living might be unhealthy was Roger Ulrich's landmark 1984 study of patients recovering from gall bladder surgery in a hospital in Philadelphia. It was a natural experiment: one wing of the hospital faced an open area with trees and landscaping and the other wing faced a brick wall. He found that patients in the nature facing rooms used fewer pain medications, were viewed as better patients by nurses, and were discharged sooner than the patients who faced the brick wall. The study has been cited over 500 times and has been used as evidence for the theory of biophilia, hypothesized by Edward O. Wilson, which maintains that humans have an innate need for connections to nature. However, while interesting and perhaps informative, the Ulrich study is not definitive. There are a number of potential confounders—other factors that may be related to the exposure (nature or wall facing room) and the outcomes (drug use, time

to discharge) that were not controlled for (location of the wing, the location of the nursing station, etc.). The difference between the two views, trees and open space versus a brick wall, may have been too extreme. How would patients have reacted to a busy street scene? A church? A cemetery? Also, the study size was small, only 46 patients, and the study outcomes were found to exist at only a certain time period of hospitalization, not the first days after surgery or the days before discharge, but in the middle week of a 14-day hospital stay.[136] At the time of the study, gall bladder patients routinely stayed in the hospital for two weeks. Today, most patients leave after a couple of days. Thus, it is not even clear if the study has any clinical relevance anymore. Nor does it definitively prove that looking out at nature makes a difference in patient outcomes. As with so many other pieces of evidence about the built environment, the study is suggestive and more research is needed. But Ulrich's study was to inform both built environment research and the growing discipline of designing health-care environments now known as evidence-based design.[137]

Jacobs, the New Urbanists, and their allies helped to revive urban living in many cities in the United States. Furthermore, we now know that these development ideas have a great ability to meet the health challenges of the twenty-first century. Public health, however, can take little credit for these ideas. Indeed, it will be seen that they accepted these ideas in advance of any evidence to suggest they really promoted health. At the time these new urban ideas began to take hold on architecture and planning, public health was faced by a terrible new crisis. Beginning in 1981, public health had to devote its energies to address a new epidemic that has since gone on to kill tens of millions of people around the world: HIV-AIDS. It was not until the rise of still another epidemic—obesity—that will also ultimately kill tens of millions later in the decade that public health researchers and advocates returned to participate in urban design debates and movement to improve the built environment.

CHAPTER 10

A New Age of Cities and Health

This chapter covers the period 1980–2010, a time of renewed interconnections between public health and urban planning. It begins with a discussion of the revival of many US cities and the demographic changes that contributed to this renaissance. This is followed by a description of the state of the field of public health in the early 1980s, just before the start of two great global epidemics: HIV-AIDS and obesity. Then the rise of obesity in the United States is detailed and the search for the causes of this epidemic is outlined. Next is a discussion of the research on the role of large-scale urban form (sprawl) and neighborhood design on obesity and physical inactivity, two of the most important health problems of this era.

The chapter then discusses other influences on the development of renewed interest in the health consequences of the built environment. Next is an outline of what is now considered to be the features of a healthy built environment. Then another relevant new tool that was developed in this time period, health impact assessment, is explained. Finally, the current state of the emerging field of the built environment and health is discussed with particular detail provided on the work of the Robert Wood Johnson Foundation in encouraging this research (table 10.1).

Changing Urban Demographics

In the mid- to late 1970s, an urban revival began in the United States as select neighborhoods and cities started to attract new investment and residents. The chaos caused by displacement ebbed, the economic free fall ended, and people began to move back to some cities.[1] The initial stirrings

Table 10.1 Key dates in the new age of cities and health

Event	Years
HIV – AIDS first identified in the United States	1981
Obesity epidemic begins	mid 1980s
Toxic Waste and Race published	1987
First National People of Color Environmental Leadership Summit	1991
Active Living Research founded	2001
Urban sprawl and public health published	2004

were in a handful of neighborhoods in the largest cities, a few communities untouched by the massive clear-cutting of urban renewal in San Francisco, New York City, Chicago, and Boston. The revival was made possible, in part, when large numbers of gay men, along with smaller numbers of gay women, began to cluster in certain neighborhoods, buying and renovating neglected buildings and opening small businesses.[2] Urban areas also began to benefit from international immigration.[3] Anti-immigrant and racist laws had effectively stopped immigration into the United States in the 1920s. But in the 1960s, Congress passed an immigration act that was race and national-origin neutral.[4] Slowly at first, then in a tremendous rush, cities began to receive people from Latin America, Asia, and Africa. Unlike the earlier waves of immigrants in the nineteenth and early twentieth centuries, these new Americans landed in cities that were well equipped to handle them.[5] There was overcrowding caused by poverty, but in general, environmental conditions were improved and the physical, economic, and social infrastructure of cities was now strong and resilient. Now we can observe the "healthy immigrant effect"; newcomers were healthier than both those who have stayed behind in source countries of immigrants and those who are native-born Americans.[6] These immigrants had a net positive effect on neighborhoods, and US cities that have increased in population have tended to be those that have been the largest recipients of new Americans. By 2000, as immigration reached highs not seen since pre–World War I, many cities also hit all-time population highs. New York City passed 8 million residents; Los Angeles approached 4 million and dozens of smaller cities grew large as well. Those cities that did not attract immigrants continued to decline.[7,8]

The wave of immigrant into cities was followed by a group of native-born, usually heterosexual, people.[9] The globalization of financial services and the media allowed New York City, Los Angeles, and other cities to attract many young people. Similarly, technology and research helped Boston, San Jose, and other technopoles to grow and prosper. More recently, there has been still another wave of movers back into cities:

empty nesters, people in their 50s and older, who now that their children have moved out of the house, find the vitality of cities a more exiting environment than child-centric suburbs.[10]

This back-to-the-city movement has not been without problems. A major concern is gentrification. In many cities, as wealthier households choose to live in urban neighborhoods, the existing poor, often non-White people are pushed out by rising rents, taxes, and housing prices. Many cities are essentially of fixed size with a fixed housing stock so that any new group arriving means others are at risk of losing their homes. This is a global problem.[11]

Public Health in the 1980s

During this urban revival, public health was busy meeting other challenges and it took a long slow path back toward reinvolvement with urban planning.[12] In 1980, there was a great optimism about the health of the US population.[13] Infectious bacterial diseases had apparently been successfully addressed through the use of antibiotics, and while viruses had not been entirely eliminated, they were seen as minor problems, easily defeated through a combination of better surveillance, effective vaccines, and the ever improving health status of the US population.[14] Public health in the United States focused on education: teach the poor and ignorant how to live better and disease would vanish.[15] Public health was also heavily involved with restaurant cleanliness, and environmental health became almost synonymous with food sanitation.

Then HIV-AIDS burst upon the scene in 1981, highlighting in terrible clarity just how dangerous viruses were and how helpless medicine was in fighting viral illnesses.[16] Public health was reenergized by the HIV crisis. Research dollars vastly increased; new people, many of them non-White and the sons and daughters of immigrants, came into the profession; and public health pushed itself back into the center of government attention.[17] Partly as a consequence of the AIDS crisis, scientific and computer advances also revitalized public health practice.[18] Rapid and new types of tests and treatments, complex interventions and new ways of conducting community-based research, and targeted media campaigns were now possible.[19] Increased computer capacities and improved telephone technologies meant that anyone could conduct surveys and analyze data. With the rise of electronic journals and data sources, people were no longer dependent on libraries for access to the latest advances, and new ideas could quickly spread.[20] The whole profession became more competent as lessons and methodologies learned in one part of the world could be quickly communicated and adopted elsewhere.

However, public health still did not address the health impacts of the built environment.[21] As we saw in Chapter 9, the Jane Jacobs revolution had passed public health by and the important new ideas of city design, New Urbanism, and community-based economic development strategies did not connect with public health. These design ideas did not benefit from the new technologies and research methods used by public health, nor did public health absorb the lessons of New Urbanism until well into the 1990s.

The Obesity Epidemic

By the end of the twentieth century, however, public health practice began to re-examine the built environment and became reintegrated with urban planning. A major contributing factor to this was that as the 1980s progressed and even as public health was working to meet the challenges posed by HIV-AIDS, a new epidemic began to develop in the United States: obesity.[22] Note that the connection between the built environment and obesity is still being assessed and the level of evidence linking the two is not as strong as that of smoking. But regardless of whether the association was real or not, it was this issue itself that probably did more to relink public health and urban planning than anything else. Thus there is a need for a detailed discussion of the epidemic, how it was identified, and how the search for causes of the increase in obesity shaped the two professions.

The very existence of the obesity epidemic slowly emerged. One important source of evidence for a rise in obesity was a newly implemented national survey. The US Centers for Disease Control and Prevention (CDC) conducts an annual telephone survey called the Behavioral Risk Factor Surveillance Survey (BRFSS).[23] The BRFSS is cross-sectional and a new sample is surveyed each year, but because the participants are sampled the same way and many of the same questions are repeatedly asked using identical wording, the BRFSS provides a powerful tool to assess trends in health risks over time.[24] The data on obesity from the BRFSS and other surveys are alarming.

Obesity is often defined using the Body Mass Index (BMI).[25] To calculate BMI, a person's weight in kilos is divided by the square of his or her height in meters. Having a BMI over 25 identifies a person as overweight; if a person's BMI is greater than 30, he or she is considered obese. In this classification system, a person who is about five foot six inches tall is overweight when his or her weight is 154 pounds, obese at 184. There is some controversy about the appropriateness of these guidelines. Some athletes may be classified as obese even though their excess weight

is due to muscle, not fat.[26] The evidence appears to be running against this argument, however. Too many heavier professional athletes die at a relatively young age compared to the general population and an athlete's excess weight is not healthy, even if it is due to muscle.[27] A stronger argument could be made that the cutoffs are low and that mortality bottoms out at about a BMI of 26 or 27, in the overweight category, and death rates do not really take off until BMI is well over 30.[28] However, these are minor arguments over the definition's precision at the margins where the exact cutoff between weight classes should be set. In general, those with a higher degree of obesity, and those whose BMI places them in weight classes of higher obesity—BMI over 35, 40, or more—are more likely to suffer serious health consequences. These people are more at risk of diabetes, heart disease, stroke, asthma, joint problems, disability, and mortality.[29] Obese people simply do not live as long or as healthy as nonobese people.

Childhood obesity is defined slightly differently, though it is still based on BMI.[30] First, many doctors and researchers don't want to call children obese and refer to the categories as overweight and at risk for overweight. Second, the cutoffs, adjusted for age and sex, are set at 85 percent and 90 percent of the weight distribution of children who participated in a national survey in the early 1990s. Children can also suffer from complications of obesity, and in addition to the social problems associated with weight, there are a whole range of health problems, one of the most important of which may be diabetes.[31] At one time, the disease was called adult onset diabetes. Now, because obesity is an important cause of diabetes and more children are obese, children are developing this type of diabetes and the name has been changed to Type II diabetes. It is no longer solely a condition only affecting adults.[32]

The BRFSS and other surveys demonstrate a striking increase in the percentages of US adults who are overweight. In 1990, only about 12 percent of US adults were obese. Fifteen years later, that percentage had doubled to 25 percent and an additional 33 percent of US adults were overweight.[33] Suddenly, in the last 20 years, an epidemic of obesity has broken out.

The causes of this epidemic are controversial and continue to be hotly debated. Because the United States is a country that places great emphasis on individual responsibility, many people believe that obesity is a personal failure.[34] They argue that obese individuals simply eat too much and do not exercise enough, and therefore they become obese; it is their fault because they lack sufficient self-control. These arguments ignore the huge numbers of obese people and the billions of dollars spent by people desperate to lose weight.[35] They also confuse proximal and distal causes

of obesity. The proximate cause may well be eating too much and not exercising enough, but what are the distal causes? What causes people to eat too much and not exercise? If it was just a matter of willing oneself to be thin, then few would be overweight. There is some truth that social norms have changed; being heavier is more socially acceptable than it used to be.[36] However, most people do not want their excess weight and the growing acceptability of obesity may just reflect a certain surrender to the obvious and inevitable.

Another argument is that people are programmed to be overweight. This "thrifty gene" hypothesis says that people are genetically compelled to overeat and store excess calories as fat. The theory contends that during prehistoric times, when people often did not have enough to eat, those individuals who could store more fat and slow down their metabolism were more likely to survive times of privation, passing along their genes to the next generation.[37] As compelling as this argument seems, however, there are problems regarding its ability to fully explain the rise in obesity rates. First, genetic change can occur only over many generations and the US obesity epidemic abruptly began in the 1980s. Thus, there was no genetic shift that set off the epidemic; human genetics cannot change that rapidly. Also, it is not that widespread hunger in the United States prior to 1985 kept people lean, after which a sudden abundance of food beginning in 1985 made more of us obese.

Because the obesity epidemic cannot be based on genetic changes, there has to be an alternative explanation. The cause could be a biological agent, a bacteria or virus could have spread through the population causing obesity.[38] There is some evidence that the gut flora in obese people is different than that of the nonobese,[39] but the link is small and lacks a biological explanation; in other words, why and how does this happen? Also, it is not clear if there are alternative explanations for the association—could weight change influence the gut environment and these changes lead to a different set of bacteria? More research is needed.

Another intriguing theory is that changes in diet, especially the replacement of beet and cane-derived sugars with corn syrup, might be responsible for the increase in obesity. There is a temporal plausibility to this. The rise in the use of corn syrup coincides with the increase in obesity.[40] Also, there is the well-documented greater consumption of corn syrup by obese people and some evidence from animal studies.[41] But the problem is that corn syrup is chemically similar to other sucrose sources and therefore the biological plausibility of the theory is questionable.[42]

Similarly, there have been interesting studies that environmental contaminants may be associated with increased obesity risk.[43] Environmental estrogenic compounds—chemicals found in cosmetics, plastics, flame

retardants, and other sources—mimic estrogen in the body. Significantly, estrogenic chemicals may contribute to weight gain by stimulating the growth of fat cells, and recent studies have linked phthalates, an estrogen-mimicking chemical that is widely used in a variety of consumer goods, with obesity. The timing is right since many of these chemicals were introduced beginning in the 1980s. However, the epidemiological evidence seems to be limited to middle-aged men with no association found in women, boys, or older men.[44] Furthermore, just as with the discussion of gut bacteria causing weight gain, it cannot be ruled out the higher levels of phthalates found in obese people's urine were caused by increased body fat, not the other way around. No one knows if the chemical causes obesity or that obesity somehow disrupts internal chemical processes and leads to greater excretion of phthalate metabolites in urine. Again, more research is needed.

More likely, one of the driving forces of the obesity epidemic may be physical inactivity. Perhaps television viewing and a lack of exercise may be responsible for the rise of obesity. Studies suggest that people who watch more television, play more video games, and surf the Internet more are more likely to be obese.[45] A problem, however, is that television viewing began well before the obesity epidemic and did not increase in the 1980s. Video games and Internet use, which did begin at the right time, have tended to happen at the expense of time spent watching television and reading, not just from physical activity. Therefore it is unlikely that an increase in these particular (in)activities set off the obesity epidemic.

These factors might be having some influence on the rise of obesity, as the problem most likely arises from multiple causes, but none of these alternatives appeared to be sufficient to explain the dramatic weight gain in this country. Thus, researchers suggested the causes for increased obesity lay in environmental factors.[46] Perhaps something in the environment is upsetting energy balance, the difference between calories consumed and expended through physical activity. Weight gain is in one sense a simple thermodynamic equation: either calories burned must match calories consumed or weight will change.

Thus the lack of alternative explanations led to a new generation of researchers, unburdened by the failures of public health's efforts to modify the built environment through urban renewal and public housing, to begin to look at the role of the built environment in promoting obesity.[47] There was a biological plausibility underlying this research: certain environments promoted poor eating habits and discouraged physical activity, upsetting body's energy balance and setting individuals' weights to spiral upward.[48] The results of this research have been far reaching. Not only have the researchers brought a new set of epidemiological skills to the

study of the built environment, they have also succeeded in reconnecting public health back to urban planning and have developed a set of institutions and a body of knowledge that inform discussion of architecture and urban planning that was not present during the beginnings of New Urbanism and smart growth. Most important, this work has replaced the old Southwood Smith paradigm of what is a healthy environment, one that focused on sunlight and ventilation as a means to prevent infectious disease, with a new conception of what is a healthy environment, one that promotes walking and nonmotorized transportation, makes healthy eating possible, fosters social connections and greater levels of social capital, and contains a wide variety of land uses and recreational amenities.[49] Having caught up with the Jane Jacobs revolution and having absorbed the design lessons of the New Urbanists, public health has reinvented and reinvigorated its research and advocacy on the built environment.

Looking at the food consumption side of the energy in/energy out equation, research has focused on the availability of healthy foods and the prevalence of unhealthy foods. Fast-food restaurants are a central target of this because they provide high calorie density food and large portions at a low price. In addition, these foods tend to be highly processed with high amounts of corn syrup sweeteners, saturated fats, and other factors that are known to be unhealthy, and recent studies show that people who frequent fast-food restaurants tend to be overweight and obese.[50] There is also some evidence that these types of establishments tend to be concentrated in low-income neighborhoods or around schools.[51] This has led to proposals to ban fast-food restaurants in certain areas such as the heavily minority South Central neighborhood of Los Angeles. However, the studies have not been of the highest quality. A widely cited study in Chicago, for example, found that fast-food restaurants are close to schools, but it did not control for population density, employment density, or any other plausible alternative explanations for the distribution of these places.[52] One study in California has found that living near many fast-food restaurants was associated with increased obesity,[53] but at least four studies have found no such association.[54] This may be indicative of the time of day when people visit these kinds of establishments. They are more popular at lunch than dinner and are most often visited near where people work rather than where they live (figure 10.1).

Others have looked at the distribution of healthy food sources and they have identified "food deserts," places, often in poor inner-city neighborhoods or rural areas, where there are no supermarkets or stores where it is possible to purchase the elements of a healthy meal.[55] Several studies, including one by this author, have documented that living at a distance from a supermarket is associated with increased risk of obesity.[56,57] The

Figure 10.1 Community garden

dearth of supermarkets may explain some of the geographical distribution of obesity, which tends to be higher in low-income inner-city and rural areas.

Researchers looked at the role of the built environment in promoting or inhibiting physical activity. The theoretical construct underpinning this is that contemporary urban design has overemphasized the car and made walking or bicycling difficult or impossible. The energy side of the food/exercise equation has been thrown off. One intriguing study used data from the National Health and Nutrition Examination Survey (NHANES), another ongoing CDC study that combines a questionnaire with a doctor's exam and extensive laboratory analyses of the subject's blood and urine. A question on the survey asked subjects how old their house was. The purpose was to identify people at risk for lead exposure. Lead paint was banned in 1978; therefore, people living in houses older than that are at increased risk of exposure and those living in newer homes are not. David Berrigan and Richard Troiano used NHANES data to see if this housing age break had any association with walking behavior. After adjusting for other appropriate factor (age, sex, race, and similar factors), they found that those subjects living in newer housing were less likely to walk.[58] Reasons for this may include the decline in residential densities after the mid-1970s and the adoption of environmental designs that

emphasized curvilinear streets in hierarchical and dendritic street patterns. Recall that prior to that time, the grid predominated.

URBAN SPRAWL AND OBESITY

The energy balance problem prompted health researchers to look at the overall level of urban sprawl to see if it was associated with changes in obesity risk.[59] The large increase in sprawl that has occurred since World War II and accelerated beginning in the mid- to late 1970s may imply that something about sprawl, or sprawl itself, is associated with obesity.

The first challenge for researchers was to come up with an objective measure of sprawl that could be used in research, with almost all of these measures having been developed since 2000. A group of researchers sponsored by Smart Growth America developed one such measure for 86 metropolitan areas for the year 2000 based on 24 separate items.[60] These individual measures are grouped into four categories and then the score from each of the categories is combined into one overall metric. Another measure, codeveloped by this author, focused on density, the most central feature of sprawl.[61] Other measures of sprawl have been developed that use employment gradients and other quantitative measures of distribution. All of these measures, with one exception that used a digitized analysis of land use based on aerial photography,[62] tend to be highly related to each other.

When sprawl measures are combined with data from the BRFSS or other similar studies, it is possible to explore the association of sprawl with obesity while controlling for other risk factors. These types of analyses became widely feasible only after the 1990s when the new statistical method of multilevel regression modeling was developed and new software packages for these types of regression models became affordable. These types of multilevel studies operate on two levels: the *individual* level, where factors such as age, sex, income, race/ethnicity, smoking, and other factors, can be controlled for, and the *metropolitan* level, where factors such as levels of sprawl, median income, and similar variables, are assessed.[63] Multilevel analysis is more precise than conventional regression statistics because standard statistical analysis assumes that all subjects are independent.[64] However, this assumption is violated because subjects living in the same metropolitan area may share common experiences. Therefore statistical techniques in these situations should reflect these constraints.

For the most part, these studies have found a small but important association between levels of urban sprawl and obesity.[65] Typical of the sprawl–obesity research is a study sponsored by Smart Growth

America, which used its sprawl measure calculated at the county level. Published in 2003 the authors found that increased sprawl was associated with increased obesity, increased hypertension, and decreased leisure time walking.[66]

While collectively the half dozen studies that have found an association between sprawl and obesity, including one by this author, are likely the beginning of a core of evidence that would suggest a real connection between the two, there are some important cautions. First, science moves slowly and there is a need for a great deal more study before the connection can be considered definitive. Second, the studies, including my own, tend to have a number of technical issues. Most use the same dataset, the BRFSS, so there is a need to use other data sources. Another problem is that the studies are cross-sectional; they look at a group of people at one specific point in time, so the directionality of causation is hard to determine. A criticism is that perhaps obese people chose to live in higher-sprawled metropolitan areas because they find walking difficult or they simply chose not to walk.[67] However, the problem with this argument is that it assumes that people can identify sprawled neighborhoods or metropolitan areas or that a lack of walkability is an amenity people actively choose. Since sprawl is a recently measured construct, all these measures were developed since 2000, and it is very unlikely that anyone chooses which metropolitan area to live in based on its sprawl level. Furthermore, there is no evidence that the public has any idea that one metropolitan area is fitter or fatter than another.

On a more local level, studies conducted over decades in the United States indicate that the most important factors influencing where people chose to live include distance to work, racial composition, housing prices, and school quality.[68] Walkability may be operationalized in housing prices, if greater demand for walkable neighborhoods causes higher prices, but there is no evidence to suggest this.

There are few national surveys that allow for a resolution to these debates. Some have used the National Longitudinal Survey of Youth (NLSY), whose original 1970s cohort is now well middle-aged. Another of its cohorts consists of the natural-born children of women in the original cohort. The NLSY was designed to study how people entered the job market and moved along their career paths; although not a health survey, it does contain health questions including height and weight, because health status helps shape employment and because disability was also of interest. A study that combined location data with the health data from the NLSY found a cross-sectional relationship between sprawl and obesity but no association between obesity and sprawl when analyzed

longitudinally.[69] However, the total number of subjects in the NLSY is relatively small, around 10,000 per cohort, and only subjects who moved between counties were really changing their exposure to sprawl, making the study sample even smaller. It may be that the sample may have lacked sufficient statistical power to find an association. So this issue has yet to be resolved.

The Built Environment and Obesity

The level of association that studies have found between urban sprawl and obesity is small, but statistically significant (unlikely to have happened by chance). An important epidemiological concept is that of "relative risk" versus "population attributable risk." Relative risk refers to the difference in risk of something happening between two populations. For example, smoking affects the relative risk of smokers contracting lung cancer compared to nonsmokers. Population-attributable risk is the amount of risk in the population as a whole, or for example, the rate at which the entire US population comes down with lung cancer because of cigarette smoking in a given year. To understand the role of population-attributable risk versus relative risk in concerning the potential impact of urban sprawl, consider the following example. The relative risk of dying if a person gets hit by an asteroid would approach infinity, virtually everyone who gets hit dies. The population attributable risk, however, is close to zero because in a given year, no one gets hit by an asteroid. The sprawl–obesity association is most likely the opposite of this. Any individual person's increased risk of obesity due to sprawl is small, but because the vast majority of people in the United States are exposed to sprawl, the actual amount of effect over the entire population is very large. The relative risk of obesity given exposure to urban sprawl is small; the population-attributable risk is large.

Given that there may be an association between urban sprawl and obesity, researchers have tried to explain how this association may reflect an underlying causal relationship. There is some evidence that increased sprawl results in increased per capita miles driven, and the more time spent in cars the more likely an adult is to be obese.[70] Car use and long commutes reduce the amount of time available for physical activity and the amount of time for shopping for food and preparing home-cooked meals.[71] Physical activity drops and food consumption increases. If these are real effects, it may mean that Jane Jacobs' idealized neighborhoods support health while the strict separation of land uses promoted by Benjamin Marsh harms the health of the public.

Additional Public Health Influences

There were a number of other new developments in public health that also helped bring the field back to the study of the built environment. From the 1990s on, many health researchers have turned to study the effects of income inequality and other dimensions of the social environment. These studies have contributed to the development of new methods that could be used to study local, regional, and national impacts of the built environment such as multilevel modeling. It has led to a renewed concern about local built and social environment conditions such as conditions related to walkability, transit, and traffic; the presence of parks, supermarkets, and hospitals; and the influence of local community demographics on behavioral risk factors.[72] Similarly, ongoing concerns about racial disparities in health propelled renewed research on the health effects of segregation, unequal access to health care and other related factors that potentially explained some of these health disparities. Another development that began in the 1980s and blossomed in the 1990s was the environmental justice movement.[73] Community activists began to express concerns about hazardous waste sites in rural African American communities, highways and jails in Latino neighborhoods, and mining on Native American lands. They began to connect these similarly separate issues and developed an understanding that there was a systemic problem of adverse environmental conditions in communities of color. In 1991, activists and community representatives came together and adopted a set of principles that proclaimed the right of all people to have safe environments in which they live, work, and play. Thus, the environmental justice movement was born. One important result of the environmental justice movement was that many public health practitioners and researchers began to understand that features of the built environment could affect health. This led to a renewed focus on the built environment in many urban and rural health departments, a new generation of scientists who have dedicated their careers to study built environments, and a growing sense of responsibility about the health impacts of development decisions among urban planners.[74]

Local Built Environment Features

Public health began to adopt New Urbanism's principles as models for what would be a healthy environment in the 1990s, well before their health effects were researched, but since that time, there have been a growing body of research that has helped reinforce this new connection

between health and the built environment. Some of these studies have looked at microlevel environments and their associations with physical activity. In general, it appears that local features can have impacts on health behavior. Simply having places to walk to is important, for example.[75] This has been measured by looking at the numbers of potential destinations such as stores, parks, and schools, and by measuring straight-line distances, street network distances, total number of destinations, or the land use mix of an area. One of the more interesting research papers that used this approach was by Lawrence Frank and his associates, who found that even in Atlanta, perhaps the current epitome of sprawl, residents of neighborhoods with greater land use mix and more street connectivity, more intersections, shorter street lengths, and other related factors, walked more. Studies suggest that living less than a quarter mile to a park promotes more physical activity.[76] Streetscapes are also important. Subjects who live on streets that have sidewalks, street lights, street trees, and less traffic are more likely to walk and less likely to be obese.[77] These associations appear to hold across differing demographic groups of US residents, explaining walking behavior of all residents, Blacks, Hispanics, women, men, low-income people, and children.[78] Neighborhoods that promote walking and inhibit obesity are also those promoted by New Urbanists. Thus, by studying obesity and physical activity, public health investigators provided new evidence that Jacobs-inspired designs address the health issues of our time. These findings imply that the design of the ideal Modernist city: broad avenues and skyscrapers set apart on large open tracts of land harm rather than protect health.[79] They may also imply that the Jacobs model of housing over stores might be desirable.

These findings have prompted public health advocates to link with urban planners to reshape urban areas, a very difficult process.[80] Retrofitting already built suburbs is expensive and logistically complex. However, by working together, public health and urban planning are beginning to advocate for mixed-use development, the realignment of blocks and streets, new ideas for redevelopment, new transit, alternative to cars, and the alteration of conventional suburban streetscapes. New programs to help people cope with the limitations of a car-oriented environment, including walk-to-school programs, traffic calming, education programs, and walking clubs, have the potential to reduce the impact of unwalkable communities. One result of the concern about obesity is that public health interventions have included efforts to change features of the built environment or develop ways to mitigate some of the identified problems. These have included programs to address food deserts such as sponsoring community gardens and farmer's markets (see Chapter 11). Public health-oriented individuals and organizations have

begun to advocate for transit, work on smart growth coalitions, or advise local communities regarding the health impacts of development.

New Health Tools

New public health methods have been developed, using new epidemiological tools and public health methods to promote healthier development and designs. One such tool has been designed to enable communities to analyze the built environment: the health impact assessment (HIA).[81] HIAs differ from older environmental impact assessments, which are heavily dependent on the statutory framework provided by environmental laws and concentrate on ecosystem impacts. First developed in Europe, an HIA focuses on human health; is not constrained by regulatory strictures or practice; and aims to inform decision makers and the public on the potential human effects of a program, policy, or development proposal. Generally, the first step in an HIA is to screen a project or proposal to determine if it is an appropriate candidate for an HIA; next is scoping, which identifies the range of potential health effects to be considered; the next step is to evaluate the magnitude of these effects; then comes reporting, communicating the results to policy makers and affected communities; and last, evaluating the process and outcomes to assess the degree to which the HIA made an impact.[82] By 2006, over 27 HIAs had been conducted in the United States, and collectively, they have helped inform development decisions and assist in policy development and have led to better communication between government and communities.[83] Again, public health has been able to bring new tools to help make the urban environment better.

Another new area of work on the built environment is Evidence-Based Design (EBD), which takes its influence from Roger Ulrich's study of hospital environments and patient outcomes.[84] EBD builds on new epidemiological tools and the large amount of data and expertise in assessing patient outcomes to study how health care and other environments affect people. These studies began looking at health care environments, looking at how patients fared in different settings and the rate of workplace injuries in hospitals and clinics. Since these beginnings, EBD has expanded to include schools and other areas that have large amounts of data and where the built environment can have a potential impact. Again, the health professions are now becoming engaged in analyzing the built environment.[85] Collectively, these efforts, the built environment movement, health impact assessment, and evidence-based design, along with other similar efforts, represent a strong reconnection of public health to planning and architecture. They connect our current ideas on how to

improve the health of the public back to the values of the reformers in the nineteenth century.

A New Field of Research

The amount and extent of research on health and the built environment dramatically expanded after 2000. As mentioned many times in this book, little epidemiological research on the health impacts of housing, neighborhood built environments, or metropolitan form took place during most of the twentieth century. Nor was there an area of research and practice that consciously dedicated itself to the built environment and health. By the 1990s, there were a number of research areas that were underway that would lead to the growth and development of the field, however. Urban planners such as Robert Cervero were looking at travel behavior and beginning studies that explored the influence of neighborhood conditions on walking and pedestrian activity.[86] On the health side, researchers were conducting research on walking behavior and its contribution to overall physical activity.[87] Sociologists and urban studies researchers were publishing on the effects of neighborhood change and the impacts of racial residential segregation on African American populations.[88] Others examined the role of neighborhood disorder and the impact of alcohol and tobacco advertising on health behaviors.[89]

All these efforts coalesced into what is now called the built environment and health since 2000. As will be discussed below, the Robert Wood Johnson Foundation established the Active Living Research (ALR) program in 2001.[90] In 2002, ALR brought together public health and urban planning researchers to identify the status of research on the built environment and explore suggestions for new initiatives to increase understanding of the environmental impacts on obesity. The Environment Section of the American Public Health Association (APHA) held its first Built Environment Institute at its annual conference in San Francisco in 2003 and a special joint issue of the *American Journal of Public Health* and the *American Journal of Health Promotion* was published in September of that year. The first Active Living Research conference was held in Del Mar, California, in 2004. University courses on the built environment appeared around 2005.[91]

One way to track the growth in research on a health topic is through charting the number of citations in Medline, the National Library of Medicine's online database of peer-reviewed journal articles. The term "built environment" had nine citations older than 1991, 14 between 1991 and 1995, 21 between 1996 and 2000, and 161 in 2010 alone. The terms "walkability" and "street connectivity" first appear in Medline in 2003,

"food desert" in 2005. These numbers should be interpreted with caution because many older journals may not have been added to the database and there has been an increase in the total number of articles published on all topics over the years, but the data still most likely reflect a large-scale increase in the amount of research on the built environment.

Though the research on the built environment is far from exhaustive, published studies cover a broad section of humanity. Researchers have documented the health effects of the build environment on the elderly, children, and adults. They have looked at US racial/ethnic populations including African Americans, Asians, Hispanics, and Whites and studies have highlighted the effects on men and women, rural and urban populations. The work has not been confined to the United States; there have been published research on areas and populations in North and South America, Asia, Europe, Australia, and, to a lesser extent, Africa.

US activities in the year 2010 help highlight the amount of research and action in the area of the built environment and public health. There were over 50 university courses on the built environment and at least two textbooks in development. The American Planning Association (APA) and the American Public Health Association and other organizations launched joint initiatives on food systems. The APA worked with the National Association of City and County Health Organizations on promoting the involvement of local health departments in land use planning and decision making. The APHA published a report on the impacts of transportation on health and the Convergence Partnership, a consortium of six major health related foundations, the CDC, and PolicyLink, a major West Coast public policy research organization, promoted healthy built environments through research, public information, and advocacy. Collectively, these activities suggest that the field is large and growing.

Again, virtually all this public health–urban planning research has been conducted within the past ten years by a broad set of researchers who came to the study of the health effects of the built environment from a wide variety of backgrounds. For example, one of the first books published on the topic, *Urban Sprawl and Public Health: Designing, Planning, and Building for Healthy Communities,* was written by Howard Frumkin, Lawrence Frank, and Richard Jackson in 2004.[92] All three were in Atlanta at the beginning of the twenty-first century: Frumkin was chair of the Department of Environmental Health at the Emory University Rollins School of Public Health, Jackson was at the CDC, and Frank was in the Department of Urban Planning at Georgia Tech. Many researchers now studying the built environment first saw the frightening maps of the spread of obesity at lectures by Jackson in the early 2000s. Frank has since moved to the University of British Columbia in Vancouver,

where he continues to publicize the health problems of the built environment. Frumkin solidified his role as one of the chief strategists of the built environment movement when he became the director of the National Center for Environmental Health, Agency for Toxic Substances and Disease Registry; and Frank is one of the most innovative researchers in the field, bringing his extensive knowledge of city planning to health research. Jackson has similarly continued to be a major influence on public health, serving as the chair of the Department of Environmental Health Sciences at the School of Public Health at UCLA.

There are a diverse group of scientists and public health researchers now involved in urban planning and studying the effects of the built environment on health. Their backgrounds are varied, reflecting the multidisciplinary nature of the field. Some researchers, including Jason Corburn, now at University of California, Berkeley, have an urban planning background. Corburn, along with Robert Bullard at Clark Atlanta University, also takes inspiration from his involvement with the environmental justice movement. Others, including Kimberly Moreland, Shannon Zenk, and my colleague, H. Patricia Hynes, became involved with work on the built environment through their commitment to social justice and are heirs to the activism of Octavia Hill, Jane Addams, and the other settlement house workers. The difference is that today's researchers and advocates have a greater range of analytic tools that they can use to study and implement new urban programs. Hynes is also an example of how researchers and practitioners concerned with lead paint issues moved on to address the larger impacts of the built environment in a field now called healthy housing. This area of research and practice now includes issues such as mold, indoor air quality, accidents, and other similar issues in addition to lead. Finally, there are the urbanologists who have come to the study of sprawl through their work on other older urban issues, such as racial segregation, including George Galster at Wayne State University and his colleagues elsewhere.

Active Living Research

A major funder of research on the built environment and health has been the Robert Wood Johnson Foundation's Active Living Research group at San Diego State University. Robert Wood Johnson decided to become involved with obesity research because of the large role the new epidemic was playing in US population health. The foundation took its inspiration from successes in the tobacco control movement, which had moved beyond placing emphasis solely on individual behavior to look instead at social and community factors promoting smoking.[93] Rather than focusing

efforts on individuals, perhaps providing nicotine patches, counseling, and other actions that directly addressed individual behaviors, tobacco control efforts moved to community approaches including, for example, laws that limited the availability of tobacco and the places where cigarettes could be smoked, ultimately changing the social availability and acceptability of smoking. First, the foundation convened a group of experts from a diverse set of disciplines to identify current theories and research gaps and establish a strategy for action. Second, it funded basic research to develop measures and diagnostic tools to define the built environment, then research on applied interventions, and finally, it tied research to advocacy for change. Now the foundation is focusing its attention on childhood obesity.

Since its beginnings, the Active Living Research Program has funded over 100 studies and projects in every part of the country, including this author's work, and involving almost every significant demographic subgroup of the population.[94] Under the direction of James Sallis, the program combines research with advocacy, and outreach and dissemination are key components of every grant. Almost single-handedly, the program has expanded the ranks of researchers in the field, helped cement the new ties between urban planning and public health, and made research on the built environment a major force in policy discussions.[95]

Today, as a century ago, there are connections between public health and urban planning. While many public health departments have yet to decide to become involved in development decisions and many urban planners may be only distantly aware of the health impacts of conventional suburban development, these efforts are beginning to reshape development decisions. Now the task is teaching the public to understand the health impacts of their residential choices. Hopefully, these new connections will give cities and urban residents a resiliency to meet the challenges of the twenty-first century.

CHAPTER 11

FUTURE TRENDS AND NEEDS

MORE THAN A DECADE INTO THE NEW MILLENNIUM, at a time when it appears that much of the United States continues to suffer from the despair of a deep and unpredictable recession, there are many reasons to be optimistic about US cities and the health of the people who live in them. Most important, twentieth–century reform and revitalization movements have successfully mitigated many of the problems caused by nineteenth-century immigration, industrialization, and urbanization. Today, almost all housing in this country has indoor toilets, kitchen facilities, access to water, and a window in every habited room. Raw sewage no long routinely fills the streets of our cities and the threat of fire does not hang over most neighborhoods. Parks, though lacking in many communities, are considered to be a basic function of government. Contrast these successes with the problems of the nineteenth century described in Chapter 2.

The lessons and implications of the past 150 years are many and varied. Edwin Chadwick and the sanitary reformers demonstrate that the public can be mobilized to address environmental health conditions by a coordinated campaign of publicity to expose problems followed by implementation of the targeted laws to address these problems. Baron Georges-Eugène Haussmann, along with Frederick Law Olmsted and the proponents of City Beautiful movement, provide examples of the ability of cities to produce lasting monumental architecture and naturalistic landscapes that can improve the quality of urban living. Their contemporaries, Jane Addams and the settlement house workers, gave to us a legacy of social justice that must infuse any and all efforts to modify the built environment. In the twentieth century, Lawrence Veiller, Benjamin Marsh, and their allies represent the power of national movements to change the fundamental legal structures that underlie the built environment in

the United States. If we similarly choose to transform urban America, we would do well to replicate their passion and expertise. Frank Lloyd Wright and the suburbanists put into built form the utopian world that underlay the American experience. The challenge of our time is to incorporate their visions into a new, more environmentally sensitive, urbanism.

We live at a time when the world cries out for the adoption of new technologies in what would be comparable to how Louis Sullivan and the Chicago School of skyscraper development incorporated the new tools of their age into their work. Perhaps the Modernists were correct when they thought that technology can rescue the world from its problems. The Modernists and Le Corbusier transformed architecture through science-based ideals. Now, builders and architects need to recenter their designs on the rationality of today's epidemiological expertise and perhaps in that way, we can maintain the progress of improvements that began so many decades ago. The lessons of the problems wrought by the mid-twentieth-century federal programs, urban renewal, public housing, and highway building, even as we still work to mitigate their impacts, are that we must pledge ourselves to never again afflict the poor in order to create new neighborhoods for the wealthy. Maybe we should pay homage to the works of Catherine Bauer and the housers by rededicating our efforts to assist those least able to afford the benefits that modern urban life has to offer.

Finally, the urban United States is still transforming itself using the ideas of Jane Jacobs and her protégés, including the New Urbanists. Critically, urbanism might need another Jacobs who will boldly sweep aside existing dogmas to establish a new way of looking at old problems while remaining mindful of, but not beholden to, the past. With the return of public health's attention to the built environment, we know about what works and what needs to be changed. Therefore, the challenge for our generation, and the ones that will come after us, will be to transform cities so that they can meet the problems that lie ahead.

Architects, planners, and public health practitioners have long dreamed of a golden age. Perhaps now their utopian ideals are within reach, if only we can visualize what they would look like. Imagine the possibilities of new communities and old cities informed by the aesthetic possibilities of both the City Beautiful movement and New Urbanism. Perhaps the scientific rationality and optimistic futurism of Broadacre City and Ville Radieuse could be fused with this effort, based on epidemiological evidence, to rebuild autocentric suburbs into low energy use, healthy neighborhoods. Then we could dwell in communities whose effects on the environment are reliably benign and where humanity learns how to prosper in harmony with nature.

A new set of values, assumptions, and ideologies could sustain the current flowering of US urbanism, a new world that will not only solidify the urban planning standards and public health successes of the past but will also be one that is accessible and occupied by all the diverse populations of the United States. These urban areas would facilitate access as well as mobility, provide a wide range of neighborhood types, and serve those who choose to walk as well as those who want to drive. Urban areas could provide safe, affordable housing for the poor and the middle class in addition to the rich, and they could be designed to promote environmental stewardship and long-term sustainability. These are not utopian impossibilities; they only need a will on the part of the public, along with visionary leadership from both the private and public sectors, to make them happen. The history in this book demonstrates that values, assumptions, and ideologies change. That is inevitable. Our goal should be to make these changes result in the most positive outcomes possible.

New Risks

It is difficult to foresee risks. Who in 1800 America could have predicted the problems produced by 1900 levels of overcrowding and substandard housing? What 1900 reformer envisioned the 2000 obesity epidemic? Though individuals are resilient, health can be fragile. We may have successfully met many of the past challenges that once confronted urban residents, but there are issues that we may need to address to meet the problems of the future. Some of these are demographic: the United States has seen a dramatic increase in the numbers of Hispanics and the population is becoming increasingly elderly. Other built environment challenges may be posed by social environment factors: income inequality is very high in the United States and there are large areas of concentrated poverty and abandonment. There are still problems with the built environment: too many communities are unwalkable, and many lack basic services such as places to buy nutritious food. Finally, there is a need to address the challenges posed by declining oil supplies and global climate change, which may require both adapting cities to use less energy and the planning for sea-level rise and other factors associated with global warming. Note that the issues listed below are nothing more than hints at the range of challenges that our country may need to address over the next 100 years.

The Growth of the US Latino Population

The 2010 Census revealed continuing shifts in the population of the United States. One of the most important of these is the tremendous

growth of the Hispanic population.[1] What in 1990 was a modest 8.9 percent of the population concentrated in a few states, now represents 16 percent of the country's population and almost every state has significant numbers of Latinos.[2] Several states are already a majority minority. Others are moving rapidly in that direction and by mid-century, non-Hispanic Whites may no longer be a majority in this country.[3]

There are potential benefits to this population growth. This group has represented the bulk of growth in this country in the past 20 years, and some states and cities would have lost population if not for Latino immigration and high birth rates.[4] Hispanics fill vital roles in this country including providing much of the workforce for the construction, manufacturing, and service industries. There is also what is known as the Hispanic paradox; Latinos, or at least those of Mexican ancestry, tend to have lower death rates than non-Latinos.[5] In general, this is a healthy population, even including the native born (immigrants tend to have better health because healthy people are more likely to emigrate).

But as Hispanics assimilate, and evidence suggests that Latinos are assimilating at a faster rate than did previous migrants to the United States,[6] their health status declines toward that of the non-Hispanic, native-born population. Already, there are serious concerns with obesity, diabetes, physical activity, and other issues in the Latino community.[7] This may make efforts to address health problem through modifications to the built environment issues an imperative.[8] Latinos are less likely to own cars and more likely to take public transportation, attributes that should be encouraged given how this lowers environmental impacts.[9]

The Aging of the Population

The United States, like most other countries, is a rapidly aging society.[10] Our median age continues to rise and the percentage of people over the age of 65 grows annually. This growth in the senior population has important implications for the built environment. Though many seniors are in vigorous health, many have sensory or other problems that make it difficult for them to drive.[11] Others become more sensitive to environmental barriers such as high curbs, fast traffic, or poorly maintained or nonexisting sidewalks.[12]

Most elderly prefer to age in place, surrounded by friends, family, and familiar environments.[13] But many neighborhoods do not support the special needs of the elderly.[14] They may require driving, lack amenities within walking distance, or present hazards for pedestrians. Therefore, there is going to be a challenge in accommodating the needs of our senior

population. Some neighborhoods are going to need senior housing that is specially designed to meet the physical and financial needs of this group. Other communities need to be redesigned, with retrofitting of streets and commercial areas to allow for access by those with sensory or physical limitations. [15]

Income Inequality

The United States has one of the highest rates of income inequality in the developed world and the past several decades as seen an increase in these levels.[16] In addition to direct health impacts, income inequality can also exacerbate problems in the built environment. Poorer communities may lack basic amenities such as parks and playgrounds.[17] They may also find it harder to enforce building codes or attract new businesses. Recall that Edith Elmer Wood demonstrated that housing is essentially an economic problem.[18] If the poor cannot afford decent housing, then they will suffer the health consequences of substandard housing. We see this in surveys of housing quality that find poverty is a risk factor for living in housing with leaks, structural problems, and other similar conditions.[19] It is also a factor in food insecurity.[20] All of these have important health impacts.[21]

Another problem is gentrification. As was noted in Chapter 9, as wealthy people decide to move into cities, they can displace the poor and other long-term residents. Though a few have tried to study the problem, little is known about how gentrification affects the health of those displaced.[22] A concern is that it could be similar to the health effects of urban renewal and other large-scale displacement of communities. Suppose that urban living becomes the overwhelming preference that suburban living was in the 1960s. How could cities and metropolitan areas accommodate a sudden shift of upper-income households into neighborhoods and a companion displacement of lower-income people to the periphery? The effects on individuals, families, and neighborhoods would be profound.

Abandonment and Disinvestment

There are serious problems with abandonment and disinvestment in many communities.[23] And after 50 or more years, decline continues in many urban neighborhoods.[24] It should be noted that not every community is experiencing these problems, even as the United States slowly recovers from a nationwide crash of its housing markets. But there are also cities where the abandonment problem is seemingly ubiquitous.

Some cities are even faced with the challenges of coping with a need to permanently shrink the area of habitable neighborhoods. This may not only be an inner-city problem.[25] Some metropolitan areas have seen the decline move out to the suburbs as well. The housing crash has also disproportionately affected certain distant suburbs.

There are health problems associated with abandonment and disinvestment.[26] Abandoned houses attract crime and can be struck by arson. Vacant lots also attract crime, illegal activity, and illegal dumping. Then there are the psychological effects of this evidence of neighborhood disorder and there is evidence to suggest that risky health behaviors can increase in these communities.[27] Solving these problems is going to take creative thinking, economic planning, and a close attention to the causes and consequences of abandonment.

Building Walkable Communities

Now that the evidence is suggesting that certain types of communities promote physical activity (important to health even if the sprawl–obesity association itself proves not to be true), a challenge is how to implement improvements in the built environment to support non-automobile transportation. Experience with building New Urbanist communities on urban peripheries suggests that it is fairly easy to build new neighborhoods with internal walkability, but that making connections between communities is more difficult.[28] In existing communities, the problem is even greater. Many are essentially built out with few opportunities for substantial rebuilding. There have been successful efforts at rebuilding older commercial strips to make them more walkable, but it is going to be much more difficult to come up with solutions for residential areas.[29]

Creating Healthy Food Environments

Research on food deserts and the influence of local food environments on nutrition have documented the important role that the environment plays in fostering healthy eating behaviors.[30] Fortunately, an increasing number of built environment interventions have also demonstrated how local food environments can be modified to promote health. These include programs to encourage supermarkets to locate in food-deprived areas, programs that work with small stores to improve food offerings, farmers markets, urban agriculture, and other programs and policies.[31] The challenge here will be how to bring these ideas to areas that have serious problems with access to food.

Oil and Transportation

There are those who maintain that the world has reached the point where a majority of the world's accessible oil has been extracted, and over the next several decades, oil supplies are going to decline relative to demand.[32] This "peak oil" theory suggests the world faces a crisis as limited supplies will force gasoline prices ever higher, eventually to the point where gasoline for most consumers, even in the United States, is unaffordable. Those who are concerned with global climate change point out that fossil fuel–powered cars are major sources of green house gas emissions and we must come up with alternatives to gasoline-powered cars if we are to prevent a global catastrophe.[33]

In response, many are promoting alternative fueled or zero-emission vehicles, cars that run on plant-based fuels, solar power, or electricity.[34] From a narrow standpoint of oil accessibility or global warming, these alternatives might well represent positive improvements. But if as a society, we simply converted the automobile to run on something other than gasoline, then we will miss an opportunity to address the other health and environmental consequences of cars.[35] A car trip using a solar car is still one where its driver did not walk; a community oriented around hybrid vehicles will still have a need for parking lots, low densities, and vast amounts of land. It may be better to use this crisis to create more walkable, compact neighborhoods and foster new investment in mass transit, rather than simply changing how our cars are powered.[36] Even zero-emission vehicles could foster urban sprawl.

Planning for Global Climate Change

Perhaps most serious of all, the great threat of global warming looms over humanity.[37] Many communities are going to be very vulnerable to sea-level rise as well as increased likelihood of severe weather events. Coastal communities are going to have to confront the problem of rising sea levels, which may flood low-lying infrastructure and neighborhoods. Rising sea levels may also speed erosion and shorten the lifespan of important community assets.[38] Given that a significant percentage of the US population lives in low-lying areas at risk to rising sea levels (not to mention the hundreds of millions who may be at risk globally), many communities may have to reassess their waterfront neighborhoods and either invest in costly infrastructure improvements or relocate to higher ground.[39] While there is time before this situation reaches a crisis, the long lead times for large-scale planning suggest it should begin sooner rather than later.

More immediate is the need to plan for the needs of vulnerable populations to meet the challenges of severe weather events.[40] Global climate change may increase the severity and frequency of hurricanes, floods, and heat waves. Experience has demonstrated that it is the poor, non-White, elderly, and socially isolated who are most at risk to these severe weather events. Hurricane Katrina in 2005 and the Chicago heat wave of 1995 disproportionately burdened these groups of people who bore the brunt of mortality and morbidity during these crises.[41] These and other catastrophes also demonstrated the need for public health and other government officials to plan ahead and anticipate the need for assisting these vulnerable individuals. With proper planning and coordination of responses, no one needs to die from these types of disasters. But if the scale and frequency of these types of events continue to increase, there will also be a need for public health and urban planners to devote more resources to anticipating them.

THE GRAND COALITION OF PUBLIC HEALTH AND URBAN PLANNING

One certainty for the future is a continuing need for further reconnection of urban planning and public health. Architects and planners must understand that their obligations to protect and promote health go beyond ensuring compliance with standard building codes. At a minimum, there is a need for more courses at architecture and planning schools to teach about the health effects of design decisions. At the same time, public health professionals must end their passive acceptance of the built environment as given, immutable, and beyond their ability to influence and modify. Public health professionals must start to participate in building and planning decisions and become advocates for healthier designs. There is precedent for public health pushing into public policy and changing society: public health ideals were a central influence on reforms from the 1830s to the 1960s. Despite some of the abuses near the end of that period, public health helped to implement many important advances in how cities were built. We can all learn from those examples.

The greatest need, however, is for a change in public attitudes toward development. Much of the United States looks how it does because people want it to look that way.[42] The concern with density, which may have made sense in the 1830 world of Thomas Southwood Smith, must give way to an acceptance of urbanism and a celebration of what is possible in higher-density cities. It is going to be impossible to address the problems of global climate change and the ongoing loss of species and wildlife habitats unless we find a way to convince a larger share of the population

to accept urban living. Or perhaps there is already this willingness. There is a need to construct enough housing so that all who wish to live in cities can live in them. Currently, if a person desires to be car-free, there are few places where this is possible, only the urban cores of a handful of cities. Yet we continue to build housing as if everyone is willing and able to drive and all people lived in two-parent families with children. We are not constructing enough units to meet demographic trends that will result in more single people and more couples without children and we must build to reflect the reality that many people need less access to cars and more access to public transport and walkable neighborhoods.

A Plea for Understanding

Urbanism in the United States is alive and thriving. New immigrants have brought a burst of color and energy to once dull communities, and it appears that many of the scars caused by mid-twentieth-century urban renewal are at last healing. Therefore, the future, as much as we can tell, looks bright. The current wave of urban development, which came to an end as recession took hold, has left its mark on US cities, and future observers looking back at our era, just as we have looked back at other times, will be able to identify the goals, concerns, and aspirations of our time through our architecture. They will be able to reconstruct our ideologies, values, and assumptions by examining our buildings, blocks, and metropolitan areas; and they will judge us, just as we have judged those who came before us. May they be sympathetic to our shortcomings. Let us hope that we will impress the people of the future and inspire future generations to take action as much as those who have come before us have impressed the people of our time and have inspired us to reach toward a more healthful tomorrow.

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CHAPTER 11

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