

CHAPTER 1

Planning, Technology, and Shrinking Cities

1.1 Introduction: Policy, Planning Context, and Book Goals

Municipal decline or urban shrinkage has been the subject of extensive academic research¹ and many recent stories in the popular press.² In the United States, a relatively large number of cities and regions have experienced increased distress over the past two decades, according to measures relating to population and economic decline, or vacant and abandoned housing. These changes have significantly reduced the quality of life for residents: extreme examples include severely degraded infrastructure in Flint, Michigan, and social unrest in Baltimore, Maryland. Declining urban centers usually fall into two large categories: the “legacy” cities of the postindustrial regions of New England, the Mid-Atlantic, and the Midwest that have dealt with industrial transition and suburban flight for many decades now (Mallach and Brachman 2013), as well as cities in the Sunbelt that have borne the brunt of the post-2008 foreclosure crisis and related abandonment of housing in suburban and suburban-style subdivisions (Hollander 2011). These trends are not limited to the United States: cities in Europe, Asia, and Africa also confront decline and shrinkage (Stohr 2004).

The reverse of the coin is that many other cities have become increasingly attractive over the past decade, as millennials and baby boomers alike recognize the benefits of easily accessible jobs and cultural amenities associated with urban living (Wieckowski 2010; Frey 2014; Nielson 2014). A recent best-selling book by Fallows and Fallows (2018) has made a highly persuasive case for the social and economic value of smaller cities, even

in decline. Recent U.S. Census data is relatively ambiguous, although it seems to indicate a moderate resurgence in suburban population growth rates as compared to traditional cores (Frey 2017). It is thus probably best to not oversell any one storyline regarding central city versus suburban growth, and overall trends of urban growth versus decline (even more so in the wake of the 2020 coronavirus crisis).

Community distress is usually a corollary of the dynamic of shrinking cities (Beauregard 2009). To provide an example, the Economic Innovation Group (2018) measures community distress using an index composed of seven equally weighted components:

1. the percentage of the adult population without a high school diploma;
2. the housing vacancy rate;
3. the percentage of adult nonelderly population not currently employed;
4. the poverty rate;
5. the median household income as a percent of the state's median household income;
6. the percent annual change in the number of jobs; and
7. the percent annual change in the number of business establishments.

By comparing distress measures between 2007 and 2011, the depths of the Great Recession, and 2012 and 2016, an era of sustained economic recovery, the EIG found evidence of migration from distressed zip codes toward more prosperous ones (the bottom and top quintiles according to the Distressed Community Index). For troubled areas, this population shift resulted in a lag in jobs recovery and business creation, higher housing vacancy rates and educational attainment, and a greater proportion of majority-minority communities—in brief, an even more concentrated degree of distress.

Vast and increasing inequality represents another particularly concerning trend in U.S. urban affairs. Studies have documented increasing gaps in income (Institute for Policy Studies 2018a), wealth (Institute for Policy Studies 2018b), household debt (Coibion et al. 2014), access to qual-

ity education (Semuels 2016), and life expectancy and other measures of physical, mental, and social well-being (Institute for Policy Studies 2018c; Centers for Disease Control and Prevention 2016). These gaps, which often cut across race, class, gender, and ethnicity lines, present structural barriers to opportunity for many Americans. In fact, a recent book (Harris and Curtis 2018) on the work of the 1968 Kerner Commission, which warned that the United States was “moving toward two societies, one black, one white—separate and unequal,” concluded, rather dispiritingly, that the social problems documented fifty years ago remain prevalent today.

Inequalities of opportunity are highly spatially concentrated, in particular in central city cores, as well as in older suburbs that have seen deindustrialization and large employer decline; very few U.S. cities enjoy both high levels of prosperity and low levels of spatial inequality. When there is some spatial equality, it tends to be at the bottom: shrinking cities tend to be in regions that also score poorly on the Distressed Community Index.

We believe there are opportunities to address municipal decline issues by using tools of planning and policy design that take advantage of recent innovations in data analytics and information technology. In contrast to recent work by one of us (Hollander 2018) that elucidates a research agenda for shrinking cities based on retrospective and exploratory analysis common to applied social sciences, we emphasize here prospective and prescriptive analyses. These are intended to provide stakeholders with specific, evidence-based responses using principles of decision sciences applied to spatial data. These responses are rooted in principles of inclusion, engagement, empowerment, and advocacy with, by, and for localized and traditionally underrepresented communities. Our book describes promising examples of data-driven decision making for shrinking cities and distressed communities, and hints at new applications that can leverage data and technology for greater positive impacts. We argue that decisions informed by qualitative and quantitative data and analytic methods, implemented through accessible and affordable technologies, and based on notions of social impact and social justice, can enable residents to play a leading role in the positive transformation of their distressed communities.

Cities certainly differ according to their ability to rebound from a period of decline; while some may regain population as local housing

and labor markets resume growth (sometimes with help from foreclosure response strategies that help stabilize troubled communities), others may require more extensive and coordinated efforts across government, private sector, and nonprofit actors to achieve regeneration. For some cities, “regeneration” may not aim at demographic gains but rather at moderating levels of population decline, new land uses and distributions of existing population, and an acceptance that the city as it evolves may not regain the level of activity and visibility that it had in the past.

The faces of decline, stabilization, and regeneration are quite varied. In Cleveland, researchers explore ways to encourage temporary uses of abandoned buildings and vacant land such as arts programming, recreational events, “pop-up” shops, and community visioning in anticipation of more permanent uses (Schwartz 2014). New Orleans, a city that lost hundreds of thousands of residents in the wake of Hurricane Katrina, has gained many new residents who tend to be whiter and more affluent than those who left (some of whom are unlikely to ever return); the “Big Easy” wrestles with booming housing markets alongside stagnating flood-ravaged neighborhoods (Sayre 2015). In Detroit, bankruptcy and a politically controversial land use plan that limits investments in certain distressed neighborhoods coexists with recent growth in the downtown core (Bradley 2013; Gallagher 2013; Detroit Future City 2012; Kinney 2016). In Baltimore, recent city-led initiatives (notably “Vacants 2 Value” and “Growing Greener”) have resulted in revitalized antivacancy actions (Thomas 2016), though popular unrest associated with a case of police violence has complicated its fight against blight (Eversley 2016).

In an exploration of gentrification, Evan Moskowitz (2017) argues that investment strategies driven by the needs of elites in government, non-profits, and for-profit companies may indeed result in overall gains in measures of municipal health, but these gains may mask starkly different levels of municipal services and business growth between certain targeted communities, with white and affluent incomers on one side, and low-income and predominantly minority communities on the other. Regeneration is a dynamic that may be broader than community-level gentrification. Many states have economically booming urban centers surrounded by pockets of postindustrial decay: in Massachusetts, Boston is doing better than ever, relying on its leadership position in the fields of higher education, biotechnology, and pharmaceuticals, while on the edges of its metropolitan region, older industrial towns like Lawrence, New Bedford, and Fall River face significant barriers to economic opportunity (Frank 2016a). The median

household income for Massachusetts in 2014 was \$67,846: but this measure masks wide variations in income (Rocheleau 2015). Boston's suburbs, comprising about a quarter of the state, generally have a median household income of over \$100,000, going as high as \$201,200 for Weston, while similar figures for Lawrence, New Bedford, and Fall River were \$34,496, \$36,813, and \$33,763, respectively (Rocheleau 2015). The large disparities in such measures of economic health between towns that are thirty to sixty miles away from each other make the notion of a single "region" only a geographic label; its communities represent different socioeconomic universes.

Such patterns recur in many other states across the country. In Ohio, Columbus is booming, while Cleveland, Toledo, and Youngstown are among the nation's fastest shrinking cities. In Illinois, Chicago is gaining population, while Rockford and Decatur continue to lose population; New York City is as wealthy as ever, while upstate New York is struggling to offer jobs, and its population is slowly drifting away. States often have a center that has gained from the transformations of the past two decades, to the detriment of many of their other towns. There are, however, exceptions: Michigan's largest city, Detroit, has lost even more people than its other struggling communities, such as Flint and Dearborn (United States Census Bureau 2015a). Amazon's recent competition among cities to host its second headquarters ("HQ2"; see Kopp 2018) was expected to result in a high-profile industrial siting generating tremendous growth in housing, ancillary businesses, education, and infrastructure in or near a city center. Indeed, the recent choice of Crystal City, in Virginia's Arlington County as the site of HQ2 (Banister 2020) is expected to generate 25,000 jobs in exchange for \$573 million in public incentives. But without concerted regional planning, intraregional inequalities may persist or even increase.

Urban shrinkage in its many dimensions cannot be dissociated from the process of globalization and the arrival of the "innovation" economy, resulting in investments shifted at ever-accelerating speed away from spaces seen as marginal for the information society. Urban shrinkage may also be associated with changes in migration patterns resulting from the current COVID-19 pandemic. However, trends associated with shrinkage need not automatically translate into decline: the resilience of various territories can be mitigated or exacerbated by many different urban, social, and economic policies as distinct from traditional large-scale economic development initiatives such as the introduction of a large employer.

This book describes a new approach to citizen-engaged, community-focused planning methods and technologies for cities and regions facing

decline, shrinkage, and blight. Our approach, inspired in part by the “big data” and “smart cities” movements, highlights the special role that decision sciences and information technology can play in enabling citizens, especially those in traditionally underserved or distressed communities, to have an active voice in the future of their neighborhoods. Acknowledging the importance of planning support systems in this task, we present a vision of inclusive planning and policy design intended especially to meet the needs of shrinking cities and declining regions that incorporates experiences of community residents, professionals, and researchers across many geographies, disciplines, technologies, and institutional contexts.

Our work is rooted in research investigating the role that data and decision analytics may play in designing flexible and evidence-based planning strategies for shrinking cities (Johnson, Hollander, and Hallulli 2014; Johnson, Hollander, and Davenport Whiteman 2015; Németh et al. 2018). Our analysis reflects recent work in a number of domains. *Community-based analytics* can address contemporary issues in housing, community development, and service delivery in which the role of residents of disadvantaged communities in problem definition, solution, and implementation is given particular weight (Johnson 2012a; Johnson et al. 2015; Johnson and Midgley 2018). *Civic data and immersive planning* enables stakeholders, including residents of distressed communities, to design, collect, and use data for community change, both in traditional analysis and novel playable games (Gordon, Schirra, and Hollander 2011; Gordon and Baldwin-Philippi 2013; Gordon and Mihaildis 2016). *Public participatory geographic information systems* enable residents seeking to solve specific planning problems that involve contested uses of space, both on land and at sea, to use GIS to develop new strategies for local development that reflect multiple conflicting understandings of spaces and uses (Craig, Harris, and Weiner 2002; Sieber 2006; Brown and Kytä 2014). *Urban analytics* represents a broader focus on the uses of mostly quantitative data from diverse sources—censuses, land uses, sensors, social media, and many others—to enable planners and policy-makers to better respond to citizen needs and to anticipate changes in population, services, and even climate (Singleton, Spielman, and Folch 2017; O’Brien 2018).

We believe that decisions informed by analytic planning models, and planning support systems based on these models, should reflect the perspectives of multiple stakeholders, facilitate active participation across diverse groups, address a wide variety of active and passive land uses, and be rooted in principles of inclusion, engagement, empowerment, and

advocacy. Such planning methods and technologies have the potential to transform our notion of what more widely available data and smart cities can do with and for shrinking cities, declining regions, and distressed communities. For shrinking cities to take advantage of these methods, they will need a commitment to community engagement, good governance, and appropriate technical expertise. Goldsmith and Crawford (2014) describe a range of promising applications in a number of large U.S. cities. There are multiple examples of IT-supported participatory planning applications applied outside of the United States (e.g., “Carticipe,” <http://carticipe.net>; “Madam Mayor, I Have an Idea,” <https://idee.paris.fr>; and SeaSketch, <https://www.seasketch.org/home.html>).

The environment of shrinking cities makes it especially difficult for disadvantaged populations to assert agency over their daily lives, and the central role of planning data, models, and technologies, especially those that use community engagement and critical, policy-focused perspectives, should be to reverse that trend. Specific improvements in communities may enable planning and policy efforts to help mitigate social stresses, reduce structural barriers to opportunity, and increase the desirability of declining regions. Of course, regional and national trends in the political economy often overwhelm more localized planning efforts: in this case, we explore how data, models, and technologies for planning can support responses to these larger dynamics.

Through analysis of specific urban communities in the United States, we study how the current practice of urban planning, policy analysis, and decision sciences generates social benefits, and for whom. Specifically, we are interested in learning whether and how these tools and applications may improve the capacity of planning practitioners, working with community stakeholders and business interests, to identify alternative pathways for development in distressed and declining communities.

Based on interactions with planning practitioners in one large and one small city in the Northeastern United States, we have developed specific decision models to support planning for shrinkage and distress. These models, based on principles and methods of community data analytics, enable planners to identify detailed and localized responses that represent improvements over current practices and technologies. We show that much more can be done to ensure that such data- and technology-driven applications reflect the needs and concerns of diverse communities, as well as those of planners. We argue that data analytics and decision technologies to address shrinkage and blight can achieve even greater impact if they

explicitly address concerns of policy impacts and social equity as well as process efficiency and planning effectiveness. However, the importance of our work is not limited to decision modeling. Our core belief is that data, information technology and analytics, as well as decision science, can enable residents of shrinking and disadvantaged communities to play a leading role in determining the uses to which their land is put, and ensure that their neighborhoods increasingly enjoy the opportunities, amenities, and influence that we normally associate with more affluent and gentrifying places.

1.2 Shrinking Cities and Distressed Communities

Shrinking Cities

According to the 2015 United States Census, sixteen of the country's twenty largest cities in 1950 have experienced substantial population decline over the last sixty-five years. This includes many rust-belt cities such as Detroit, Buffalo, Cleveland, Pittsburgh, St. Louis, Baltimore, and Philadelphia. In some of these cities, the population has dropped by more than 50 percent (see table 1.1).

Shrinking cities have been defined by scholars as involving more than population decline—these cities are marked by physical blight and

Table 1.1. U.S. Cities with the Highest Absolute Population Loss, 1950–2010

<i>City</i>	<i>Population in 1950</i>	<i>Population in 2010</i>	<i>Absolute Change</i>	<i>% Change</i>
Detroit	1,849,568	713,777	-1,135,791	-61.4
Chicago	3,620,962	2,695,598	-925,364	-25.6
Philadelphia	2,071,605	1,526,006	-545,599	-26.3
St. Louis	856,796	319,294	-537,502	-62.7
Cleveland	914,808	396,815	-517,993	-56.6
Pittsburgh	676,806	305,704	-371,102	-54.8
Baltimore	949,708	620,961	-328,747	-34.6
Buffalo	580,132	270,240	-309,892	-53.4
Cincinnati	503,998	296,943	-207,055	-41.1

Source: U.S. Census Bureau 2015.

economic transformation. The Shrinking Cities International Research Network defines a shrinking city as “a densely populated urban area with a minimum population of 10,000 residents that has faced population losses in large parts for more than two years and is undergoing economic transformations with some symptoms of a structural crisis” (Hollander et al. 2009, 6). Other definitions in the literature suggest “increasing levels of vacant and abandoned properties, including blighted residential, commercial and industrial buildings” as characteristics of such cities (Schilling and Logan 2008, 452).

We start by noting that the demographic shift in shrinking cities can be measured in terms of both race and income. Baltimore, Detroit, and St. Louis, to name just three, were majority white in 1950, but by 2000 had shifted to majority African American (U.S. Census; Cohen 2001). Additionally, median income as a percentage of standard metropolitan statistical area median income has decreased significantly over the past sixty-five years (Cohen 2001). This means that wealth has spread to the suburbs, leaving the urban core significantly poorer.

WHY CITIES SHRINK

Shrinking cities are everywhere, but the reasons different cities undergo such transformations can vary enormously. Several suspects include natural disasters (Vale and Campanella 2005), deindustrialization (Bluestone and Harrison 1982; McDonald 2010), suburbanization (Jackson 1985; Clark 1989), globalization (Sassen 1991; Hall 1997), and of course the natural economic cycle of boom and bust (Rust 1975). Beauregard’s (2009) analysis of shrinking U.S. cities from 1820 to 2000 argued against such wholesale claims, concluding instead that causes of population decline vary from one historical period to another. A paper produced from an Urban Affairs Association annual meeting affirmed that view; a global group of scholars discouraging a “one-size-fits-all” explanation for why places lose population (Großmann et al. 2013).

Among experts on cities, two models explaining why neighborhoods depopulate tend to emerge as frontrunners: neighborhood life-cycle theory and an alternative, neighborhood change theory.

By viewing neighborhood change in terms of a life cycle, the first theory posits that places grow and die in a way analogous to the human body: “the constant cycle of birth, life, and death is inevitable in both” (U.S. Federal Home Loan Bank Board 1940, 3). Hoover and Vernon (1962)

described five stages in a neighborhood's life cycle: new development, transition, downgrading, thinning-out, and renewal. The Real Estate Research Corporation (1975) outlined five similar steps along a continuum: healthy, incipient decline, clearly declining, accelerating decline, and abandoned.

Neighborhood life-cycle theory was developed in an effort to better understand and rationalize the declining city. Many writings on the topic set out to identify planning and policy interventions that might either arrest or reverse this "natural" process (Bradbury, Downs, and Small 1982). The stated goal of policy-makers was to help revitalize devastated places while preventing the future deterioration of existing stable neighborhoods. Neighborhood life-cycle theory has been tremendously influential in U.S. urban policy and planning, but has been subject to insightful critique (see Metzger 2000).

Believing that such policies can arrest the slow death of neighborhoods, Blakely (1994) and others in the economic development tradition draw on neighborhood life-cycle theory in advocating public intervention through investments in vacant land. Described as redevelopment or revitalization, this approach is often top-down in nature and uses forced relocation via eminent domain to achieve its objectives. A notorious example of this approach is the Boston Redevelopment Authority's urban renewal program in the West End of Boston (Gans 1962; Teaford 2000). More recently, the City of New London's Supreme Court victory allowed it to move forward with the condemnation of sixty-four privately owned homes in order to allow the expansion of a large corporation (Langdon 2005; Salzman and Mansnerus 2005). The *Kelo v. City of New London*, 125 S. Ct. 2655 (2005) case generated a groundswell of popular sentiment against the use of eminent domain for the purposes of economic development and provoked a rash of new state laws and public protests against government seizure of private property for economic development (Egan 2005).

The dominant interpretation of neighborhood life-cycle theory is that public investment is needed to stop an out-of-control process. This view of neighborhood change fails to account for those scenarios in which a city loses population but does so without suffering the expected accompanying blight. Rather than look for ways to manage population loss so that blight may be prevented, the theory only allows for the neighborhood to be seen as growing or declining, alive or dead (Hollander et al. 2009).

According to Metzger (2000), the future of a city depends not on its stage in a "natural" life cycle, "but on whether residents had access to financial resources within an environment of community control" (7).

Metzger draws on a body of critical theory that rejects the modernist notions of advance and retreat, of growth and decline. Beauregard (2003) also explores this dialectic in examining the discourse of urban decline. He finds that urban decline was incorporated into a socially constructed story of the rise of suburbia and the fall of the city—a fictional account reified into the public consciousness through oral and written communication.

Critics such as Dear and Flusty (1998) advance a postmodern notion of neighborhood change that escapes this grand narrative and allows the details of each city, each neighborhood, and each block to speak for itself. Mitchell (2002) contributes to this alternative theory in his account of planning in Egypt. He shows how the “informal, clandestine, and unreported” activities of society determined planning outcomes, not the “fabricated” script developed by Western colonizers. An understanding of urban decline as a disaggregated, finely complex phenomenon is possible under this alternative theoretical framework. This alternate theory of neighborhood change allows planners to be cognizant of urban problems while avoiding the inevitability embedded in the discourse of urban decline. Such an unshackling from the structures of urban decline opens up the possibility for city leaders to work toward proactively managing depopulation.

A planner or policy analyst drawing on this alternative theoretical framework may attempt creative intervention as described above, or may avoid action altogether. Hoch (1996) suggests that a consequence of postmodern planning practice is that a sense of hopelessness may infect the planner because all interventions are somehow intertwined with the forces of power. The planner who embraces alternative neighborhood change theories may be reluctant to label her city as “in decline,” or might be timid about her own ability to manipulate power relations in an affected neighborhood.

Indeed, we can attribute much of the success of community development professionals in general, and community development corporations (CDCs) in particular, to their grounding in this alternative neighborhood change theory. For decades, CDCs and grassroots organizations have fought for a higher quality of life for residents of some of the poorest neighborhoods in America. For the most part, CDCs reject conventional views of neighborhood death and dying and instead promote new building and growth, often through the construction of new, affordable housing. New movements are underfoot, however, that recognize a certain inevitability of decline but plan for these demographic and socioeconomic shifts in proactive ways.

Race, Ethnicity, Shrinkage, and Distress

Shrinking cities tend to become more homogenous as they get smaller, in terms of percentage of the population in poverty, and in terms of race (Wilson and Taub 2007; Sugrue 2005; Logan and Stults 2011). Many of the largest shrinking cities in the United States are in some of the most highly segregated metro areas—Detroit; Gary, Indiana; Pittsburgh; Baltimore—leading Logan and Stults (2011) to coin the term “Ghetto Belt” to describe such areas across the Northeast and Midwest.

The concentration of African American and Latino populations in shrinking urban areas attracts the attention of critics who contend that past discriminatory practices are alive and well. Researchers studying hazardous waste facility siting in the 1980s noted a high correlation between the location of those facilities and the presence of poor and nonwhite populations, suggesting an environmental injustice (Bullard and Wright 1990; O’Hare, Bacow, and Sanderson 1983). Much attention followed, leading to the birth of an entire field of environmental justice, which is concerned with how disadvantaged groups too often bear the unfair burdens of community decline, disinvestment, pollution, and waste (Bullard 1994; Agyeman 2005; Schlosberg and Rinfret 2008).

In shrinking cities, the shifting racial make-up of emptying neighborhoods tends to create racialized ghettos, making local government intervention in these areas subject to increased scrutiny. The Massachusetts State Government has classified hundreds of neighborhoods throughout the state as “environmental justice communities” based on demographic characteristics like race, income, and environmental exposures. For these designated communities, the acute problems of shrinkage are required to be addressed through direct engagement that acknowledges roles of race, ethnicity, and language (Commonwealth of Massachusetts 2018).

We use the notion of “distress” to represent adverse social and physical characteristics of communities associated with racial, ethnic, and class residential segregation and structural barriers to opportunity. Shrinkage and decline have complicated relationships with community distress; to capture these distinct but complementary concepts, we refer to “shrinking” or “declining” cities and “distressed communities” throughout the book, but do not treat these terms as synonymous.

Scholars such as Henry Taylor have deeply explored the impacts of race, ethnicity, and class in declining cities and distressed communities, focusing particularly on the intersections of systematic structural racism, market-based approaches to urban development, and the knowledge-based

neoliberal economy (Todd 2018). While Dr. Taylor is pessimistic about the current level of influence of marginalized communities in urban change, he looks to recent public opposition to police violence and the Movement for Black Lives, as well as Black Lives Matter, as potential catalysts to a new movement to empower these communities based on principles of Lefebvre's Right to the City (Lefebvre 1996; Shields 2013).

Social Justice, Equity, and Shrinkage

Scholarship and practice on smart decline has faced criticism that such interventions reflect values and result in behaviors consistent with discredited notions of urban renewal, or are inappropriate strategies for saving cities (Gratz 2011; Florida 2011). Foundational work on smart decline (Németh and Hollander 2011) presented a number of propositions based on notions of equity and social justice. The goal of these propositions was to be able to test notions of procedural and distributive justice in practice. Recently, these authors (Németh et al. 2018) tested these propositions using the example of the city of Baltimore (a city we will discuss in detail throughout this book). They found that, since 2000, through multiple planning, demolition, and redevelopment initiatives intended to address blight, vacancy, and abandonment, the city has made only modest progress toward ensuring that citizens have a high level of knowledge of, engagement with, and ownership of neighborhood-level strategies.

Vacancy and Abandonment

With some context on why places depopulate, which people are most often directly impacted, and the implications of these impacts for social justice and equity, we now turn to the most well-known outcome of decline: vacancy and abandonment. As there is no universally agreed-on definition of vacant property, legal definitions vary by city. Many cities use length of vacancy and structural conditions of the unit as primary criteria (Cohen 2001). As defined by the National Vacant Properties Campaign, vacant properties are:

vacant residential, commercial, and industrial buildings and lots that threaten public safety and/or have been subject to the neglect of fundamental duties of property ownership. Neglect of ownership duty includes failure to pay taxes or utility bills, mortgage default, and failure to pay liens on the property. (Schilling 2008, 463)

The vicious cycle of disinvestment that Schilling highlights, wherein landlords fail to make necessary repairs and stop paying property taxes, leads to declining property values, often resulting in foreclosures and abandonment. This, in turn, only further depresses the housing market (Cohen 2001).

Vacancy has arisen largely as a result of shrinking populations—the U.S. cities with the largest number of abandoned housing units are also the cities with the most dramatic population decline (Cohen 2001). More recently, however, the subprime mortgage crisis and subsequent rampant foreclosures have contributed to widespread vacancy. Baltimore alone had more than 33,000 home foreclosures between 2000 and 2009 (Role of the Lending Industry 2009). Baltimore's long history of minorities being denied access to credit and of racially segregated living patterns make the city particularly susceptible to predatory lending (Role of the Lending Industry 2009). This, along with the mortgage crisis, contributed to a disproportionate number of foreclosures in black neighborhoods in the city (Blessett 2011).

Vacant and abandoned properties can be expensive for cities, in terms of both economic and social costs. A recent study in Baltimore found that each additional vacant building costs the city \$1,472 per year—largely in additional police and emergency response costs (Winthrop and Herr 2009). Vacant buildings have also been linked to higher rates of fire, injury, crime, and illegal activity including prostitution, violence, and drug sales and use (Schachterle et al. 2012; Garvin et al. 2013; Gomez and Muntaner 2005). Research supports the linkage between vacancy and increased rates of poor health outcomes such as HIV/AIDs, STDs, premature mortality, diabetes, and suicide (Garvin 2013; Gomez and Muntaner 2005).

The physical impact of vacancy and abandonment on an urban landscape, which includes not just empty buildings and lots but also broken windows, trash, and drug paraphernalia, constitutes in part what is often referred to as “physical neighborhood disorder.” Physical disorder is defined as “visible cues in the environment that indicate lack of control over neighborhood conditions” (Garvin et al. 2013). Research has shown physical disorder to be associated with crime, fear, and social isolation, resulting in further physical and social decline (Garvin et al. 2013). Disorder has also been linked to poor health outcomes such as cardiovascular disease, obesity, and mental illness (Robert Wood Johnson Foundation 2008; Dulin-Keita et al. 2013; Chang, Hillier and Mehta 2009).

The fear and social isolation associated with neighborhood disorder can reduce people's perception of safety and social interactions in their

neighborhood, which can lead to such adverse changes in behavior as reduced physical activity. If people are scared to go outside, or if the physical environment is not conducive to exercise or play because of glass, needles, or damaged sidewalks, physical disorder can be a significant deterrent to physical activity. Just as physical disorder can deter outdoor activities, presence of quality features in the built environment, such as enjoyable scenery, is strongly associated with increased physical activity (Chang, Hillier, and Mehta 2009). Parks, walkability, and street connectivity are also associated with physical activity—attributes often lacking in neighborhoods with a high degree of disorder (Dulin-Keita et al. 2013).

Physical disorder can also lead to poor health and social outcomes such as chronic stress and risky behavior. In addition, social ties, collective efficacy, and social capital, all of which are associated with positive health outcomes, are all reduced as a result of the social isolation resulting from neighborhood disorder (Garvin et al. 2013). Garvin and colleagues note that “physical disorder is theorized to lead to negative health outcomes by promoting chronic stress and attendant maladaptive physiologic responses, encouraging risky behavior, and eroding resident social interaction” (413). A 2008 systematic review of the relevant literature found consistent associations between social cohesion and physical health (Kawachi, Subramanian, and Kim 2008). The presence of social capital was found to decrease rates of obesity, diabetes, cardiovascular disease, and all-cause mortality and to increase self-rated health.

This link between social capital and health outcomes is made via various mechanisms. Social cohesion has been shown to cause positive psychosocial effects and to foster network-based resources (Eicher and Kawachi 2011). Additionally, collective efficacy, found to be a strong determinant in health behaviors, is developed in communities where there is an ability to mobilize for collective action (Glanz, Rimer, and Viswanath 2008; Eicher and Kawachi 2011). Informal social control or other behaviorally mediated mechanisms can also improve health outcomes in communities with strong social capital (Eicher and Kawachi 2011).

The built environment can influence the level of social capital by providing spaces for formal and informal interactions and promoting shared investment in physical spaces (Eicher and Kawachi 2011). Just as parks are associated with increased physical activity, they are also linked to higher levels of collective efficacy, which can in turn facilitate more pedestrian travel and promote social interactions. All of these types of social interactions, however, are jeopardized in neighborhoods with high levels of vacancy and disorder.

Changes to the built environment are not always positive. Redevelopment efforts, while intended to improve neighborhoods, often cause disruption and displacement, both of which have been linked in many studies to increased levels of stress, feelings of hopelessness, and associated negative health outcomes (Gomez 2005). According to Gomez and Muntaner (2005), “[When] redevelopment results in the displacement of residents without assurance of adequate shelter, the health of community residents suffers through mental disorder, exacerbation of chronic illness and subsequently premature death” (99). Being uprooted from one’s home is a source of stress, as is lack of influence and the ability to make choices about the fate of one’s home or neighborhood (Gomez 2012; Fullilove 2001).

An extensive community investigation in East Baltimore, where large-scale redevelopment efforts have been focused in recent decades, found that the neighborhood lacks communitarian and institutional social capital due to disruption and distrustful relationships with developers, institutions, and government (Gomez and Muntaner 2005). This leaves the community without much strength for organizing in the face of redevelopment efforts. Themes from the study suggested both insufficient bonding relationships among community organizations as well as insufficient bridging relationships between the community and external institutional networks. This lack of social capital reveals a community with very little perceived control over redevelopment efforts, and thus very little perceived influence over the health outcomes of the neighborhood.

1.3 Sample Cities for This Book

This book is motivated by our desire to generate planning and policy insights for shrinking and declining cities and regions, and for distressed and blighted communities. However, for ease of analysis, we focus here on central cities, understanding that different approaches can generate different insights associated with different kinds of study areas. In order to learn how cities can respond to shrinkage, distress, and blight through the lens of data and decision analytics, we will examine multiple central cities that vary along a number of dimensions. While there is a well-developed theory of case study research (Yin 2018), this book will not pursue a formal case study design. Instead, we have selected a convenience sample of cities based on our experience with each, proximity, and access to local officials. This choice was made in consideration of a variety of historical, demographic, geographical, and socioeconomic dimensions.

In order to situate these three cities and ensure they were somewhat representative across a variety of characteristics, we began by considering three categories of cities. The first category is “Massachusetts Gateway Cities,” smaller, postindustrial cities in Massachusetts, the state in which two of us (Johnson and Hollander) have conducted extensive research, that are the focus of regional development policy (MassInc 2012). The second category is “Great Cities,” thirty cities with population ranking more than 500,000 inhabitants in 2010 (U.S. Census 2016). The third category is cities of various sizes considered by scholars to be of special interest because of declines in population, economic activity, or quality of life (Beauregard 2009; Hollander 2011; Silverman et al. 2016). Table 1.2 lists sixty-one cities across these three categories.

Table 1.2. Candidate U.S. Cities for Shrinkage and Distress Analysis

<i>30 cities with largest population in 2016</i>		<i>Cities of particular interest to scholars of shrinkage and decline</i>	<i>Massachusetts Gateway cities</i>
Austin, TX	Los Angeles, CA	Ashland, KY	Brockton
Baltimore, MD	Memphis, TN	Birmingham, AL	Fall River
Boston, MA	Milwaukee, WI	Buffalo, NY	Fitchburg
Charlotte, NC	Nashville, TN	Camden, NJ	Haverill
Chicago, IL	New York, NY	Cleveland, OH	Holyoke
Columbus, OH	Oklahoma City, OK	Dayton, OH	Lawrence
Dallas, TX	Philadelphia, PA	East St. Louis, IL	Lowell
Denver, CO	Phoenix, AZ	Flint, MI	New Bedford
Detroit, MI	Portland, OR	Jackson, MS	Pittsfield
El Paso, TX	San Antonio, TX	Memphis, TN	Springfield
Fort Worth, TX	San Diego, CA	New Orleans, LA	Worcester
Houston, TX	San Francisco, CA	Norfolk, VA	
Indianapolis, IN	San Jose, CA	Pittsburgh, PA	
Jacksonville, FL	Seattle, WA	Reading, PA	
Las Vegas, NV	Washington, DC	Richmond, VA	
		Rochester, NY	
		Syracuse, NY	
		Trenton, NJ	
		Wheeling, WV	
		Youngstown, OH	

We believe that insights regarding responses to shrinkage and distress through data and decision analytics are likely to vary according to city type. For this research, we selected a city from each category: one Massachusetts Gateway city, one Great City, and one city of special interest to scholars of shrinkage and distress. As these categories of cities differ by population size, we chose cities across three population sizes: small (less than 100,000 population), medium (100,000 to 500,000 population), and large (greater than 500,000 population).

The causes and nature of shrinkage and distress differ according to histories and traditions of economic and social development that vary across geographies, so our choice of three sample cities reflects different U.S. regions. Social scholarship has traditionally distinguished between U.S. regions based on “physical characteristics, cultures, politics and history of the states” (TheClassroom.com, 2018); we refer to nine divisions grouped into regions as Northeast (New England and Mid-Atlantic), Midwest (East North Central and West North Central), South (South Atlantic, East South Central, and West South Central) and West (Mountain and Pacific) (U.S. Census Bureau 2013). Our sample of cities reflects the New England, Mid-Atlantic, and East North Central regions.

Insights regarding responses to shrinkage and distress by U.S. central cities will vary according to the nature and intensity of shrinkage and distress. Multiple studies have proposed and quantified measures of shrinkage, distress, and blight (e.g., see Ganning and Teague 2018; Manville and Kuhlmann 2016; Hollander 2018). Metrics used by researchers include single-dimensional measures such as population change, housing vacancy, unemployment, poverty, education attainment, prevalence of single female-headed households; derived measures such as segregation based on residential location, school enrollment, poverty and wealth, and composite measures such as the Weaver Index (Weaver et al. 2017), defined as the geometric mean of population percent nonwhite, percent persons who have not graduated high school, percent of households that are female-headed, percent of population that is below poverty, and unemployment rate. We will not create a comprehensive database according to consensus measures and rank cities. Instead, we show that certain of the cities listed in table 1.1 have particularly high levels of population change, both overall and by nonwhite persons, as well as housing vacancy change, associated with shrinkage and distress (table 1.3).

Finally, our work in this book draws from our previous published research on shrinking cities (Johnson, Hollander, and Hallulli 2014; Johnson, Hollander, and Davenport Whiteman 2015).

Table 1.3. Changes in Population and Vacancy Measures in Candidate U.S. Cities

<i>City [Region]</i>	<i>Population Percentage Change, 2000–2016</i>	<i>Population Percentage Nonwhite Change, 2000–2016</i>	<i>Housing Vacancy Rate Change, 2000–2015</i>
Ashland, KY	-3.97	1.50	-0.30
Austin, TX	41.00	-20.05	-4.80
Baltimore, MD	-5.24	5.65	8.50
Birmingham, AL	-12.35	1.79	7.40
Boston, MA	14.02	6.45	-3.00
Brockton, MA	3.07	61.82	0.00
Buffalo, NY	-12.08	15.79	3.40
Camden, NJ	-6.72	-4.77	4.00
Charlotte, NC	47.69	26.69	-4.20
Chicago, IL	-6.60	-4.90	4.60
Cleveland, OH	-19.05	6.36	4.90
Columbus, OH	20.13	22.81	-2.30
Dallas, TX	10.66	-8.89	-2.60
Dayton, OH	-15.27	3.74	9.60
Denver, CO	24.63	-25.11	-6.90
Detroit, MI	-28.83	1.52	18.60
East St. Louis, IL	-14.69	-0.87	9.80
El Paso, TX	20.94	-26.92	-5.10
Fall River, MA	-4.13	158.88	-3.20
Fitchburg, MA	-3.01	-8.11	-4.40
Flint, MI	-21.93	-0.08	11.60
Fort Worth, TX	56.43	-3.24	-5.40
Haverhill, MA	23.06	1.30	-8.90
Holyoke, MA	-7.84	-32.01	1.0
Houston, TX	16.43	-7.41	-0.50
Indianapolis, IN	10.55	23.96	3.00
Jackson, MS	-8.70	24.78	3.70
Jacksonville, FL	19.55	16.65	2.80
Las Vegas, NV	30.64	32.55	0.70
Lawrence, MA	14.59	-35.48	-5.00

continued on next page

Table 1.3. Continued.

<i>City [Region]</i>	<i>Population Percentage Change, 2000–2016</i>	<i>Population Percentage Nonwhite Change, 2000–2016</i>	<i>Housing Vacancy Rate Change, 2000–2015</i>
Los Angeles, CA	7.34	-5.37	-6.40
Lowell, MA	6.89	42.29	-6.70
Memphis, TN	-5.43	15.55	4.20
Milwaukee, WI	-0.34	22.35	-2.00
Nashville-Davidson metro, TN	25.37	11.94	-2.80
New Bedford, MA	-3.50	57.93	-9.60
New Orleans, LA	-19.06	-5.88	7.20
New York, NY	6.53	7.31	-0.90
Norfolk, VA	4.62	-0.09	-4.60
Oklahoma City, OK	25.77	11.81	-5.00
Philadelphia, PA	3.57	9.73	2.20
Phoenix, AZ	21.61	18.70	-1.40
Pittsburgh, PA	-9.01	3.72	0.90
Pittsfield, MA	-12.19	2.22	-5.60
Portland, OR	20.75	7.47	-8.60
Reading, PA	7.71	13.42	-1.30
Richmond, VA	12.86	-3.89	1.70
Rochester, NY	-4.83	3.86	-4.40
San Antonio, TX	28.26	-30.09	-4.60
San Diego, CA	14.67	-8.16	-7.60
San Francisco, CA	12.03	16.66	-3.10
San Jose, CA	13.44	26.76	-9.50
Seattle, WA	24.86	15.97	-7.30
Springfield, MA	-1.84	-26.30	1.00
Spokane, WA	9.24	30.32	0.75
Syracuse, NY	-1.84	18.38	-1.10
Trenton, NJ	-1.58	-5.32	10.80
Washington, D.C.	19.14	-13.56	-1.30
Wheeling, WV	-12.52	-2.43	-0.40