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LOCAL ECONOMIC DEVELOPMENT AND THE ENVIRONMENT

Finding Common Ground

SUSAN M. OPP
JEFFERY L. OSGOOD, JR.

CRC Press
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American Society for Public Administration Book Series on Public Administration & Public Policy

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Dedicated to Drs. Peter B. Meyer and Hank V. Savitch

For being the inspiration for all that we have achieved in our scholarly pursuits.

Thank you.

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SECTION II IMPLEMENTATION: THE SUSTAINABLE ECONOMIC DEVELOPMENT TOOLKIT

Preface

Setting the Context: Theories and Concepts of Economic Development and Sustainability

Public officials, nonprofit administrators, and policymakers are often presented with arguments that sustainability and economic development are opposing goals. This, however, need not to be the case. Section I of this book provides an introduction to the academic and practical intersection of the environment and local economic development. Chapters in Section I address questions, such as:

- What exactly is sustainable economic development? Is it something that local administrators can engage in?
- How can development be pursued while worrying about protecting the natural environment?
- How does energy and transportation relate to sustainability and economic development?
- How have some local governments engaged in these aspects of sustainable economic development?

Throughout Section I (Chapter 1 to Chapter 4), real-world examples are used to assist the interested local administrator with understanding how these concepts relate in the real world. Wilmington, North Carolina's, experience with low-impact development provides an excellent example of the cost-savings potential of one type of sustainability initiative: low-impact development. Portland, Oregon, provides an in-depth look at how clean energy can be integrated into a larger community-wide economic development plan. Tucson, Arizona, illustrates sustainable transportation initiatives that spur economic activity. At the end of this section, readers will have a broader understanding of sustainable economic development from an academic and comprehensive perspective.

Implementation: The Sustainable Economic Development Toolkit

While Section I of this book provided a broader, more academic, look at sustainability and economic development, Section II moves to a more practitioner-oriented examination of the tools available for pursuing sustainable economic development. Through these chapters, it becomes apparent that the current economic toolkit need only be slightly tweaked and it too can help to find the common ground between sustainability and economic development.

Starting with a review of how public administration and sustainability have come to embody similar ideals and concluding with a review of the financial and technical aspects of implementing sustainable economic development, Chapter 5 through Chapter 12 cover a wide variety of issues related to implementation and tools for sustainable economic development. While certainly not an all-exhaustive listing, the chapters in this section offer concrete explanation and illustration of many of the most common tools used in economic development, but in such a way that they are now elevating the principles of sustainability. Questions this section of the book addresses include:

- How has the discipline and practice of Public Administration addressed sustainability?
- What is a public–private partnership? How can it help me?
- Can my local college or university help in sustainable economic development efforts?
- Eminent domain: What do I need to know? How is it related to blight and contamination? What did *Kelo v. New London* mean for a local government?
- Tax increment financing: Can I use it in my project?

Several important examples are used throughout the chapters in this section to help provide illustration of concepts. Cookeville, Tennessee, offers insights into the role that public–private partnerships can play in sustainable economic development. The experience of the University of Illinois at Urbana-Champaign and the Smart Energy Design Assistance Center offers lessons to cities on effective town-gown partnerships. Learning more about San Diego's experience with their ballpark district redevelopment provides important insights into eminent domain. Finally, the complex Trinity River project in Fort Worth, Texas, illustrates the complexity to some redevelopment projects that utilize tax increment financing, eminent domain, and other tools simultaneously to achieve successful development.

Sustainable economic development will often require outside financial and technical support to be successful. The two penultimate chapters in Section II provide readers with a look at the variety of resources available and information on how to best obtain these resources. Important information on grant administration,

funding availability, and grant applications is provided in Chapter 10. Chapter 11 provides readers with an overview of the federal and state resources available for sustainable economic development efforts. Questions addressed in these chapters include:

- What kinds of grants exist? Where do I look?
- What does a beginner need to know about finding and applying for a grant?
- How are regulations and grants connected?
- What programs exist to assist with remediation and redevelopment efforts directed at contaminated properties? Where do I start?
- What laws do I need to be concerned with in my remediation/redevelopment efforts?
- What resources exist for energy efficiency projects to help my community save money while being more resource efficient?

About the Authors

Susan M. Opp, PhD, is currently an assistant professor of Political Science at Colorado State University, Fort Collins. Dr. Opp's professional experience cuts across both the academic and practitioner worlds. In her various professional roles, she has served as the director of a NASPAA (National Association of Schools of Public Affairs and Administration)-accredited MPA (Master of Public Administration) program, graduate internship director, faculty steering committee member for the Clean Energy Supercluster at Colorado State University, research associate for the Environmental Finance Center at the University of Louisville, and deputy director of the Center for Public Service at Texas Tech University (Lubbock). Her research has appeared in a number of academic and professional outlets including *Economic Development Quarterly, Environmental Practice, International Review of Public Administration,* and *ICMA InFocus,* to name a few. She is also the co-editor of *Local Sustainable Urban Development in a Globalized World* (Ashgate, 2008). At Colorado State University, Dr. Opp teaches graduate seminars in Public Policy Analysis and Scope and Methods of Political Science.

Jeffery L. Osgood, Jr., PhD, has extensive experience working with state and local governments through a variety of positions over the past 10 years. His areas of expertise include local economic development and program evaluation. He has previously worked at the Center for Local Governments at Western Kentucky University (Bowling Green), and currently serves as director of the Center for Social & Economic Policy Research at West Chester University of Pennsylvania. In his time with the Center for Local Governments, Dr. Osgood worked on projects ranging from wage and benefit studies to pay classification analyses. Currently, as director, Dr. Osgood has been involved with a number of studies ranging from health needs analyses to program evaluations for both public and private organizations, as well as nonprofit foundations. He holds a doctorate in Urban and Public Affairs and a master's of public administration (MPA). As a faculty member at West Chester University in the Public Administration Graduate Program, Dr. Osgood teaches courses in Research Methods, Public Sector Organization Theory and Behavior, and Foundations of Public Administration. His research has been published in the *International Journal of Urban & Regional Research, Journal of Political Science Education, Economic Development Quarterly, Public Personnel Management*, and *Government & Opposition*.

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Both of us also offer separate thanks. Susan Opp would like to extend her personal thanks and appreciation to her immediate family for their support and patience during the many nights spent without her as she worked on the volume. She is grateful to her husband, Chris, and two daughters, Victoria Lisa and Alexandra Rose. All three are owed a debt of gratitude for their patience, support, and love over the past 2 years.

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also contributed to his work by taking vague directions and translating them into figures.

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1

SETTING THE CONTEXT: THEORIES AND CONCEPTS OF ECONOMIC DEVELOPMENT AND SUSTAINABILITY

Chapter 1

Local Economic Development and Environmental Protection: The Intersection

Economic development and environmental protection are often viewed as competing interests that require significant tradeoffs (Campbell, 1996). However, as "sustainability" and "sustainable development" become common parts of modern academic and policy discussions, many American cities are attempting to reconcile these competing interests through public policies and local initiatives. Even with the increasing recognition of the terms *sustainability* and *sustainable development*, a great deal of misunderstanding still exists. For many people, sustainability is simply another word for environmental policy or environmental protection. For others, sustainability and economic development cannot be pursued simultaneously and be successful. For American cities to engage in economic development while remaining environmentally conscious, local administrators, policymakers, and public administration students must more fully understand the intersection and common ground of economic development and the natural environment.

This book provides an easy-to-read and concise resource for local public and nonprofit administrators, policymakers, and students of public administration interested in understanding and ultimately pursuing *green* economic development. Rather than relying on vague and abstract concepts associated with

sustainable economic development, this book provides clear explanation and demonstration of the concepts in action. In order to accomplish this goal, this first chapter will provide the necessary foundation to understanding local economic development and environmental sustainability. Following this first chapter, the remaining sections of the book are more specifically focused on tools and techniques of local sustainable economic development. This book is not written as an endeavor in convincing students and practitioners of the need to pursue environmentalism, rather this book is focused on demonstrating and illustrating ways to reconcile the tension between economic development and sustainability. This book will take some of the more abstract concepts surrounding sustainable development, environmental sustainability, and economic development practice and give them concrete, easy-to-follow definitions and discussions with examples of real-world applications for the interested city, local administrator, and public administration student.

Following this introductory chapter, the book is organized into two distinct sections. Section I sets the context of the intersection of economic development and environmental protection. Chapters in Section I (1–4) detail and explain some of the broader sustainable economic development concepts and techniques. Each chapter in Section I provides a real-world case study to help highlight some of the difficulties faced and ultimately the solutions found by local practitioners who are engaging in these sustainable economic development efforts.

Section II of this book moves on to specific tools directed at implementing sustainable economic development practices. These nuts and bolts chapters are designed to provide practitioners with an understanding of the actual techniques of sustainable economic development, including public private partnerships, tax increment financing, and eminent domain for sustainable economic development, among others. It becomes apparent in the second part of the book that the current economic development toolkit need only be slightly modified in purpose and use to achieve sustainable outcomes. Chapters in Section II (5–12) are written in such a way that cities in the position to engage in these practices will find useful information in adapting them to their own economic development practices. Many of the chapters in Section II also provide real-world case studies of successful efforts using the techniques profiled.

Section II concludes with two chapters designed to provide guidance on the various grants and resources available to participants in sustainable economic development. The book concludes with a reflective and prospective chapter centered on the common ground of economic development and environmental protection. For now, the remainder of this chapter will turn to an introduction to suburbanization, local economic development, and sustainability.

Suburbanization, Economic Decline, and Local Economic Development

In 1970, for the first time, more people lived in suburban cities than anywhere else in the United States (Morgan, England, and Pelissero, 2007). Between 2000 and 2009, Americans continued to spread out across metropolitan areas and the "… less developed, outer areas grew at more than three times the rate of their cities and inner suburbs" (Brookings Institute, 2010, 7). This suburbanization of America led to a number of negative consequences for many American cities including urban decay, sprawl, concentrated poverty, and environmental degradation. These negative consequences were originally specific to the older central cities; however, many of these problems have now started to emerge in the suburban cities.

As modes of transportation evolved from horse and buggy to personal automobile, the American urban form changed alongside this progression. As people spread out into suburban areas, the central cities began to experience the ill effects of losing population. Throughout the twentieth century, central city residents continued to move away from the urban core and into the newer, more attractive suburban locations. As this migration took place, commercial activity soon followed, both to follow the workers, but also to take advantage of the national highway system. In light of these devastating trends, central cities were faced with a declining tax base and increased urban blight as buildings became vacant or underutilized. This pattern of fleeing residents, lower tax revenues, and declining conditions created a self-perpetuating effect where increasing numbers of residents would leave the rapidly decaying central city because their suburban counterparts looked comparatively more attractive (Atkinson and Oleson, 1996). This continuing decentralization of metropolitan areas, and the related economic and social impacts, is often associated with what many characterize as sprawl.

Sprawl

Although there is not one specific definition of sprawl, many characterize it as, "… the rapid expansion of metropolitan areas … [with a] complex pattern of land use, transportation, and social and economic development" (Frumpkin, 2002, 201). Generally, sprawl is cast in a very negative light and at least partially faulted for a number of the more serious urban problems. First, as a region spreads out and becomes less dense, automobile dependence among the region's residents rises. With increased automobile dependence comes a variety of social and economic pathologies including air pollution, increased traffic fatalities, increased road construction and maintenance needs, and decreasing quality of life (Atkinson and Oleson, 1996; Frumpkin, 2002; Lambert and Meyer, 2008). Second, as regions sprawl, farmland and open space is consumed for the sake of new development. As the demand for land in the periphery of a region grows, farmland and open space begin to be converted into residential or commercial development. With this loss of open space and

farmland comes higher farm prices and, subsequently, higher food prices (Livanis et al., 2006). Third, as residents abandon the central cities and then later the inner ring suburbs, many vacant, idle, and abandoned buildings and properties are left behind (often termed *blight*). These abandoned places sometimes contain environmental contamination further contributing to decay in the central cities.

Finally, urban sprawl is often identified as a contributor to social and economic segregation in metropolitan areas. As multiple political jurisdictions emerge in a region, people are able to self segregate by social, economic, and racial groups (Le Goix, 2005). This segregation often leads to increased fiscal inequities across regions, with some jurisdictions being very wealthy and others being very poor (Brookings Institute, 2010). Perhaps most disturbing for cities and regions is the realization that the inequities resulting from sprawl have longer-range implications for many aspects of the community, such as education quality and local service provision.

The pathologies associated with suburbanization and sprawl can have dire consequences on some cities. Detroit, Michigan, is certainly an extreme example of the impact that sprawl, suburbanization, urban decay, and deindustrialization can have on a city. According to the United States Census Bureau, the population of Detroit declined by 25% from 2000 to 2009. In addition to a declining population, Detroit is over 80% African American, has almost a 25% unemployment rate, and close to 35% of its residents live in poverty. At its height of success, Detroit enjoyed almost 2 million residents and was lovingly referred to as the Paris of the West (Sweeting, 2010).

Presently, the mayor of Detroit is struggling to manage a city that cannot afford to provide the basic services to its residents. In fact, Mayor Dave Bing recently announced a plan to force the residents of the city's sparsely populated and poorest neighborhoods to relocate in an attempt to salvage some financial solvency in the city (Oosting, 2010). Residents faced with the threat of relocation were told that if they didn't move, the city might not be able to provide services to those left behind. Although Detroit may be an extreme example, many cities are struggling with declining populations, job losses, and poor economic conditions and are desperately working to formulate a plan to reverse these trends.

As sprawl and urban decay continue in many cities, local administrators have begun to seriously examine how they can implement policies that will improve the conditions of their communities. Local administrators have found some solutions to the problems associated with changes in the economy and urban form through sustainability initiatives. As a result, in the most recent years, the academic literature has begun exploring environmental concerns as they relate to economic development practices, usually under the banner of sustainable development or sustainable economic development (Blakely and Leigh, 2010). In order to fully understand the role of sustainable economic development, it is necessary to provide some background information on the role of local economic development in American cities.

Local Economic Development

Local governments in the United States are responsible for providing a multitude of direct services to their citizens including police and fire protection, primary and secondary education, streets, parks, libraries, and museums, among others. In order to provide these and other municipal functions, local government must collect enough revenues to cover the costs of maintaining these services. According to the United States Census Bureau, local governments collected approximately $1.5 billion dollars in 2007 across their various revenue sources with a large portion of this total coming from tax revenues. (See Figure 1.1 for a breakdown of tax based revenue sources.) The most common tax sources for local governments are property and sales taxes (U.S. Census Bureau, 2007).

A city's ability to provide services is closely linked to its revenue capacity. When property values drop, unemployment climbs, and subsequent consumption of goods decline in a city, local elected officials and administrators are faced with a very difficult situation where their tax revenues decline, but city services are still very much needed. In some cases, declining economic conditions may actually cause an increase in the need for some services in a community. For these reasons, and others, most local governments concern themselves with some form of local economic

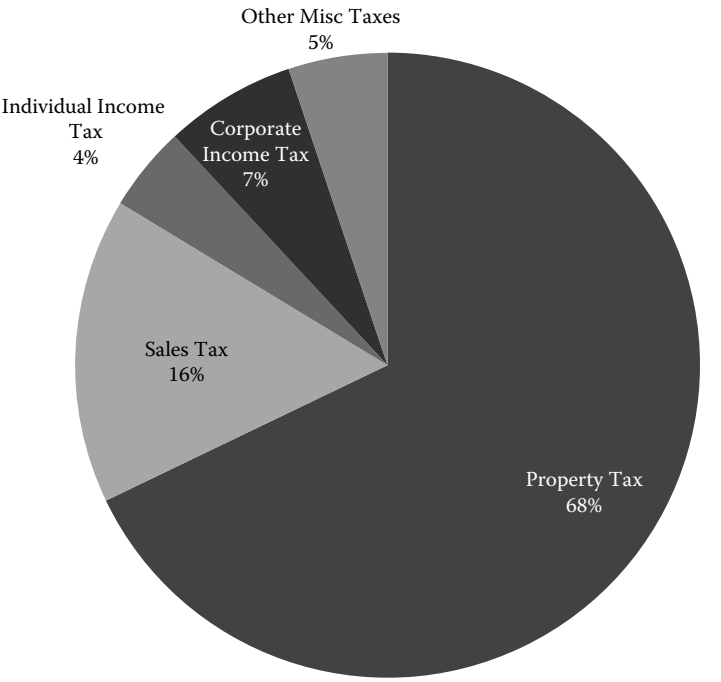

Figure 1.1 Breakdown of local revenue sources. (From U.S. Census Bureau, 2007.)

development in order to preserve and/or grow their tax revenues. In recent years, local economic development has grown even more complex and complicated, as the broader U.S. economy has shifted in response to globalization, technological changes, immigration, and a general aging of the population.

The globalization of many goods and services has led to a fundamental shift in the economy, which is sometimes termed *The New Economy*. According to Blakely and Leigh (2010), the New Economy is "… a set of qualitative and quantitative changes that in the past 15 years have transformed the structure, functioning, and rules of the economy…" (p. 7). First, and most obvious, the new economy is increasingly global in nature. Even at the local level in the United States, administrators are indicating that they are facing more competition for economic development from across the world (Osgood, Opp, and Bernotsky, 2012). Second, the new economy has become even more entrepreneurial. By this, it is usually meant that changes in the economy are happening more quickly as new businesses are more innovative and specialized than in previous decades and are rapidly replacing older businesses. Finally, the new economy is strongly connected to information technology. Technology is pervasive across all economic sectors and has worked to greatly increase productivity (Blakely and Leigh, 2010). With this new economy comes the reality that cities must evolve to be successful in future economic development endeavors.

In 2010, the Brookings Institute published its most recent *State of Metropolitan America* report. In it, the institute outlined five conditions that metropolitan areas are facing: continued sprawl, population diversification, aging of the population, uneven higher education attainment, and income polarization. These new realities will certainly continue to impact the ability of local governments to provide effectively for their citizens. Local economic development practice and planners will have to evolve to accommodate the new status quo in order to be successful in any efforts to expand their local economies.

History of Local Economic Development Practice

Local economic development practice has a long and rich history in the United States. Early research generally defined economic development as some variant of wealth creation, which usually meant more jobs, tax revenues, or some combination of the two (Bartik, 1990; Blakely and Bradshaw, 2002; Wolman and Spitzley, 1996). However, a growing number of economic development scholars have expressed concern that defining economic development in such simple terms has contributed to many of the problems communities are experiencing with environmental degradation and severe inequities in wealth among residents (Blakely and Leigh, 2010). Given this growing understanding, in 2010, Blakely and Leigh defined economic development for the first time in a way that included sustainability as a foundational goal in their highly regarded local economic development book.

Although in recent years sustainability has permeated the local economic development literature, this is still a relatively new phenomenon. Over the past century,

Table 1.1 Waves of Economic Development Strategies

Wave Number and Title	*Key Aspects*
1: Business Attraction	Attract businesses to local community. Heavy use of incentives.
2: Business Retention	Keep the businesses that are in the local community. Reward loyalty.
3: Quality of Life and Sustainability	Quality of life and environmental issues impact local economy and need to be a focus of development efforts. Tourism and smart growth are popular strategies.

Source: Koven, S., and T. Lyons. 2010. *Economic development: Strategies for state and local practice*. Washington, D.C.: ICMA Press.

local economic development practice has evolved through several overlapping phases or waves. (See Table 1.1 for an overview of these waves.) The first wave of local economic development practice centers on attracting businesses through extensive use of incentives and infrastructure provision. Wave one strategies were seen in the United States as early as the 1930s (Fitzgerald and Leigh, 2002; Koven and Lyons, 2010). These first wave strategies are generally regarded as some of the most contentious and politically charged of all economic development strategies. Starting around the 1960s, it became apparent to many scholars and practitioners that some of the commonly used incentive-based strategies were not actually attracting new businesses or jobs, rather, they were simply transferring them between different locations and cities (Koven and Lyons, 2010; Zheng and Warner, 2010).

Wave One Strategies for Economic Development

Wave one strategies are, in part, responsible for some of the most serious environmental degradation found in many cities. Historically, it was not profitable for the private sector to engage in pollution prevention and environmental protection practices (Opp and Osgood, 2011). This fact led many businesses to pursue development in ways that were not always protective of the environment. Local governments often inadvertently contributed to this situation by providing a variety of incentives to encourage businesses to choose particular locations for expansion or relocation. These incentives would sometimes have perverse environmental consequences. As cities compete for mobile capital, they act in ways that show little concern for the longer-range consequences of the use of incentives and the resulting development. Under these circumstances, governments become almost captive to the interests of private businesses. Additionally, by the 1960s, many cities had experienced the shortcomings of an economic development plan that focused too heavily on incentive provision (Koven and Lyons, 2010). The limitations associated with

an incentive-heavy focus led to a shift in economic development practice toward business retention, or wave two, strategies.

Wave Two Strategies for Economic Development

Wave two strategies generally focus on business retention activities and tools. As cities competed for businesses and economic development, it became apparent that rather than actually attracting jobs "… jobs were transferred between locations" (Blakely and Leigh, 2010, 59). In part as an effort to stem the loss of jobs to competing cities, economic development practice began to focus on business retention strategies and tools (wave two strategies). Generally speaking, within wave two strategies, incentives are provided to existing businesses only as a means of retention or as assistance for expansion and growth. In this wave, incentives to attract new businesses are viewed less favorably than those incentives directed at existing businesses.

Wave Three Strategies for Economic Development

Recently, many of the factors discussed earlier in this chapter, such as environmental degradation, social and economic inequalities, and declining quality of life were identified as being interrelated with local economic development. In part as a response to this emerging realization, a third wave of local economic development strategies have been identified that generally focus on quality of life aspects of a community and the relationship it may have with local economic development. Wave three strategies include sustainability and dimensions of community quality (education, community image, etc.) directed at attracting and retaining businesses by having a desirable locale (Koven and Lyons, 2010; Zheng and Warner, 2010). In some literature, third-wave strategies include a social justice or social equity aspect to them as well (Blakely and Leigh, 2010).

Presently, aspects of all three waves of local economic development can be seen in cities across the United States (Bradshaw and Blakely, 1999; Koven and Lyons, 2010). However, as the broader economy continues to change, so does the mixture and reliance on different tools of economic development. In recessionary times, particularly during and in the years following, cities have been found to shift their focus back to the wave one strategy of using incentives to attract business in the face of persistent unemployment and declining tax revenues (Osgood, Opp, and Bernotsky, 2012).

The three waves framework of local economic development is a useful metaphor for the practice of local economic development, in part, because "… it places attraction and retention within an evolutionary progression" (Koven and Lyons, 2010, 118). Related to this, in 2010, Zheng and Warner used the three wave framework coupled with national-level data from 1994 to 2004 to conclude that many local governments actually *learn* important lessons from their economic development practices and, subsequently, progress in an evolutionary manner, even while still relying on strategies

from all three waves. If the three waves framework is to be viewed as an evolution, then cities engaging in wave three strategies are more advanced and potentially better at adapting to the changes in the economy and urban form. As mentioned earlier, one of the key aspects of wave three strategies is the introduction of environmental or sustainability concerns to local economic development. As such, it is prudent to understand the basics of sustainability and sustainable economic development.

Sustainability and Sustainable Economic Development

Sustainability and sustainable development are technically two different things. The concept of sustainability is generally used in a broader and more holistic sense than sustainable development. Researchers have identified three interrelated dimensions (sometimes referred to as the "Three Es") important for the pursuit of sustainability: **E**nvironmental Protection, **E**conomic Growth, and Social Progress or **E**quity (Adams, 2006; Campbell, 1996; Jepson, 2004; Saha and Paterson, 2008). Under this framework, sustainable economic development is simply one third of the requirements for actually achieving global sustainability.

The concept of sustainable development can be traced back to at least 1969 when the International Union for Conservation of Nature (IUCN) declared that economic growth without environmental harm was possible (Adams, 2006). In 1987, with the publication of the Brundtland Report, sustainable development became a more widespread and accepted concept and goal for many nations, states, and, ultimately, American cities. In the years after the publication of this report, many were left with varying definitions concerning what constitutes sustainable development (Goodland, 1995; Hopwood, Mellor, and O'Brien, 2005; Mazmanian and Kraft, 2009). Even more confusing to many practitioners and policymakers was exactly how to pursue sustainability within their economic development efforts. The confusion is even more profound at times of economic hardships.

Globally, sustainable development efforts have been very diverse and prevalent. Across the world, "[g]overnments, communities, and businesses have all responded to the challenge of sustainability to some extent" (Adams, 2006, 2). Various case studies exist that begin to document the variety of laws, regulations, and efforts directed at some aspect of sustainability (see, for example, Chifos, 2007; Heberle and Opp, 2008; Jepson, 2004; Lubell, Feiock, and Handy, 2009; Nijkamp and Pepping, 1998; Portney, 2003; Wheeler and Beatley, 2009; Zeemring, 2009). American cities have begun to emerge as active participants in the quest for global sustainability.

Sustainable Cities

Although many analysts recognize that American cities lag behind their international counterparts in the implementation of sustainability efforts, they are still important subjects for inquiry (Slavin, 2011). As Ostrom (2009) aptly

points out concerning global climate change efforts, "[g]iven the slowness and conflict involved in achieving a global solution, recognizing the potential of building even more effective ways of reducing energy use at multiple levels is an important step forward" (p. 38); this same lesson can be applied to sustainability and American cities. If sustainable development is viewed normatively as a positive endeavor, then local efforts toward sustainable development initiatives is a worthy goal for the betterment of the world (Anglin, 2011; Pierce, Budd, and Lovrich, 2011; Portney, 2003; Saha and Paterson, 2008). Even those who do not share a normative interest in environmental protection can agree that quality of life and economic development are inextricably connected to the condition of the natural environment and that future engagement in economic development will require some consideration to the quality and protection of the natural environment.

In addition to the environmental benefits associated with pursuing sustainability initiatives, many local policymakers and administrators have leveraged these initiatives to achieve a number of other beneficial outcomes including improving the quality of life in their community, responsibly grow their local economy, and provide for greater social justice (Anglin, 2011; Portney, 2003; Saha and Paterson, 2008). As mentioned earlier, in the local economic development literature, environmental sustainability initiatives have found a near universal recognition as being part of the so-called third-wave economic development strategies (Koven and Lyons, 2010). Furthermore, sustainability has become a dominant urban planning paradigm in recent years, with an emphasis on smart growth principles (Saha, 2009). Certainly, sustainability is not going to go away any time soon given its increasing acceptance among scholars and practitioners alike. To be sure, the concept of sustainability has become so ubiquitous that most conversations concerning the future of cities include a serious discussion of sustainability.

Conclusion

Although sustainable economic development has been identified as a positive goal for many years, most cities are still struggling with exactly how to effectively identify and replicate sustainable economic development practices within their own jurisdictions. In addition to the normative benefits to be obtained by protecting the environment, sustainable economic development offers at least two important economic benefits. First, sustainable economic development often mirrors traditional economic practices by attracting and/or retaining businesses. Additionally, sustainable economic development efforts also often serve as a cost-savings tool. Through these cost savings, a local government can reallocate funds to other projects deemed important to the community. Many of the tools and techniques highlighted in this book offer local governments a

way to achieve cost savings through their economic development and service delivery efforts.

The remaining chapters highlight many techniques and tools that are being used to seek increased economic development and cost savings while being protective of the environment and its resources. In the chapters that follow, a geographically diverse set of case studies illustrates the concepts in action. With the intent of offering readers a range of localities, cases have been selected from cities as large as Fort Worth, Texas, to the much smaller Cookeville, Tennessee. These examples offer the reader insights into the pitfalls, difficulties, and successes associated with pursuing the techniques and tools related to sustainable economic development. Many cases offer real-world advice directly from the administrator in charge of the project on how to overcome the difficulties experienced. Finally, this book concludes with a resource guide designed to assist the administrator trying to pursue economic development in an environmentally conscious manner.

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Chapter 2

Sustainability and the Built Environment

A variety of terms are important to understand when thinking about the aspects of a city that can have a relationship with economic development and sustainability. *Urban design* is concerned with the overall design of a city, *land use* addresses land development activities across the city, *transportation systems* deal with infrastructure related to transport in a city, and, finally, the *built environment* encompasses all of these things under a larger umbrella (Handy et al. 2002). While many of the remaining chapters will deal with smaller pieces of the built environment—transportation, energy, and management, for example—this chapter is concerned with the wider-scale concept that we call the built environment.

The built environment can have a large impact on the quality of life as well as the economic development potential of a city. Unfortunately, many communities are struggling with problems associated with their built environment. As discussed in Chapter 1, many cities followed a development path over the past century that led them to fiscal and social inequities and environmental degradation. Downtown decline, revitalization, infill, sprawl, brownfields,* and grayfields† are all terms used to describe aspects of a city that are closely related to the environment and economic development. In fact, some cities will begin exploring something akin to sustainable economic development due to the problems associated with urban

* Abandoned, idled, or underused real property where expansion or redevelopment is complicated by the presence or potential presence of environmental contamination (www.HUD.gov).

† Previously developed commercial properties, which are underutilized, undeveloped sites (sometimes called *dead malls*) (Hazardous Substance Research Center, June 2007, www.hsrc-ssw.org/update27).

decline and sprawl. There are two broad, but important, aspects of the built environment that local administrators can focus their efforts on to encourage economic development that is sensitive to the environment: redevelopment/revitalization and anticipatory development (Daniels and Daniels, 2003). These broad concepts will include many smaller topics that will be covered in-depth in other chapters of this book. This chapter will, on the other hand, first discuss redevelopment/revitalization, sometimes referred to as remedial development, and then turn to a discussion of anticipatory, or new, development. The goal of this chapter is to provide a broad look at how a city can simply use a green lens when pursuing development to find the common ground between the environment and economic development. To further illustrate the connections and relationships between economic development, the natural environment, and the built environment, this chapter concludes with a case example of Low Impact Development in Wilmington, North Carolina.

Revitalization and Redevelopment: Remedial Efforts

The word revitalization has found a common place in many local economic development efforts. For example, Miramar, Florida, has an explicit revitalization effort as part of its larger economic development efforts. The city says, "[b]y definition, 'revitalize' means to give new life or vitality to something. The city's revitalization efforts reflect this, ranging from housing programs to business assistance to social services, redevelopment initiatives, and public infrastructure improvements. Combined, these are bringing positive change and results" (City of Miramar, 2012). Revitalization efforts are a natural combination of economic development and sustainability. In the broadest sense, revitalization is about improving and redeveloping an area of a community that has suffered from a declining economic and social condition. This aspect of revitalization goes very well with the 3 E's definition of sustainability: It improves the **E**conomic condition of a neighborhood, improves or sustains the natural **E**nvironment by not contributing to sprawl for development, and, finally, it addresses social **E**quity by working on poverty problems in a community. It is easy to understand the natural connection between economic development and sustainability simply by examining the diverse revitalization efforts across the United States.

Urban or central city decay is not an uncommon phenomenon across the United States. Initially, the hardest hit area in most communities was the old central business district (CBD). Following a fundamental shift in the American economy in the second half of the twentieth century, many cities found themselves with a declining population, changing and/or declining economic base, and increasing crime rates (Porter, 1997). Eventually many suburban areas also faced similar negative changes. Many cities followed a similar development path that led them to face the problems they deal with on a day-to-day basis.

How Did Cities Evolve?

Transportation plays a big role in shaping how American cities look. In the early part of the nineteenth century, most transportation was centered on the railroad. As rail lines expanded and began connecting cities together, the shape of urban America began to change. Prior to the turn of the twentieth century, a majority of a city's workers lived within walking distance of their place of employment. City centers were usually very crowded and filled with a diversity of people all competing for living, working, and commercial space.

As technology advanced over the early part of the twentieth century and transportation options expanded, cities began to look very different. Initially, residents of cities relied upon the horse and buggy and walking to get where they needed to go. However, by 1829, New York had the first public transportation system, the horse-drawn omnibus, which could transport 20 to 30 people (Morris, 2007). Ultimately, the streetcar became widely available, which further changed how cities developed and evolved. As public transit emerged as an affordable option for traveling from residence to workplace and commercial district, a development pattern likened to a starfish emerged (Adams, 1970). Growth occurred along streetcar rail lines and people began to be able to separate their homes from their places of employment. Given the relatively poor living conditions in the central cities, it was not unexpected that residents would welcome the opportunity to relocate to a newer, less densely populated area.

Following the streetcar, the personal automobile also allowed city residents to spread beyond the original borders of the city. As the automobile became the most common mode of transportation for city residents, development patterns began to shift away from public transit hubs and stretched out to previously remote locations. Suburbanization was now possible for a larger portion of city residents. Those that had the ability to move away from the older, poorer, and possibly decaying central cities were quick to relocate to newly developed suburban cities. Exacerbating this suburban flight was the passage of the Federal Aid Road Act of 1916 and the Interstate Highway Act of 1956. In 1916, the federal government provided transportation aid to more rural areas thereby enabling those individuals in the periphery of larger cities to participate in the broader economy (U.S. Department of Transportation, 2011). The Interstate Highway Act of 1956 created the federal interstate system that connects cities and states together, further facilitating sprawl (Weingroff, n.d.).

As transportation technologies shifted from slow, limited-access public transit to faster, open-access individual automobiles, the American urban form changed radically. As the increasing suburbanization of America occurred during the twentieth century, many cities were left with large swaths of blighted, declining, and sparsely populated areas. While transportation initially played a large role in facilitating sprawl and urban decay, transportation also can play a role in reversing these trends. Chapter 4 will delve into the role of transportation in sustainable economic development.

Moving Forward in American Cities: Revitalization

As cities continue to be confronted with the effects of declining areas, it is important for administrators to look for redevelopment and revitalization opportunities when pursuing economic development. Several concepts are important for local administrators interested in revitalization in their communities: greenfields, grayfields, brownfields, infill, and gentrification. This section will discuss the differences between these concepts and provide some advice to the local administrator interested in revitalizing parts of his/her city. By improving the older and declining sections of the community, cities will likely see economic rewards through increased property tax revenues, increased sales tax revenues, additional employment opportunities, lower crime rates, and, ultimately, a higher quality of life for all residents.

Greenfields, Grayfields, Brownfields, and Infill

Regardless of the specific definition of economic development a city uses, the central goal of most cities' economic development efforts is to provide job opportunities, increased tax revenues, and ultimately a better quality of life for the residents. When a city seeks to support, encourage, or approve a new development in their community, it is important to understand the types of development locations available to them and make decisions deliberately to balance environmental and economic concerns. Traditionally, it has been the greenfields that were most popular to developers and cities. *Greenfields* are the open, undeveloped areas in a city and in some instances may include farmland. These greenfields are generally less expensive to build on than other types of property in a region and may be located near newer population centers. Greenfield development is often the least environmentally conscious of these three types of properties and often contributes to sprawl. It is estimated that the average city has approximately 20% of its land undeveloped (Daniels and Daniels, 2003). Greenfield development ultimately means less open space, less farmland, and, in many cases, more blight in older parts of a city.

Grayfields, unlike greenfields, have been previously developed and are generally considered less difficult to redevelop than brownfields, but perhaps more difficult than greenfields. Usually grayfields are former commercial properties that are completely vacant or underutilized. Large areas of gray concrete parking lots often surround grayfields, giving them their name (Chilton, 2004). It is expected that virtually all declining areas in a city will have problems with grayfields.

Brownfields are generally the most difficult of sites to redevelop due to the possibility of environmental contamination. These properties traditionally were old industrial sites that have now closed. However, recently, some commercial and even residential developments have been categorized as brownfields due to contamination from lead-based paint or asbestos. Many cities face brownfield problems in their declining areas.

Although these properties have burdens stemming from the previous use, grayfields and brownfields also have a number of beneficial aspects that may help a city market them. Some of the key benefits that often can be associated with grayfields and brownfields include already existing infrastructure, low property acquisition costs, and the potential for federal and state funding opportunities. Additionally, when development occurs within the existing development of a city, additional sprawl can be avoided or reduced.

Clearly, revitalization efforts imply a focus on older, declining areas of a community. For this reason many revitalization efforts rightly focus on grayfields and brownfields. By having this focus, a city has started engaging in economic development that contributes to benefits for the natural environment. For a community that is interested in following a sustainable and environmentally conscious path, it is necessary for development to first be focused on these brownfields and grayfields before considering other areas. Most greenfields should be a last choice for the environmentally concerned city seeking to support development efforts. "Focusing on these sites first helps preserve the community's greenspaces while correcting the problems associated with the brownfield and grayfield properties" (Opp and Osgood, 2011, 6).

Although grayfields and brownfields are important first targets for revitalization, technically revitalization also can include greenfields. If the development can be considered infill, then greenfields can be an important and appropriate target for revitalization efforts. Infill is development that occurs within existing development or development that fills in gaps in other development (Wheeler, 2002). Infill development can span all three types of property from greenfields to brownfields. However, the key to infill development is that the development is targeted within the boundaries of other development rather than sprawling out on the periphery of a community. Infill development has the key benefit of drawing upon existing infrastructure as well as limiting the growth of the boundaries of a city.

Gentrification

One last important concept to understand related to revitalization is gentrification. In recent years, there has been a blurring of the boundaries between gentrification and revitalization. In fact, there isn't even an agreement on exactly what constitutes gentrification. However, reviewing the knowledge, literature, and popular perception of gentrification allows for a distinction to be made between revitalization and gentrification. Revitalization seeks to improve communities and neighborhoods without displacing those that live in that community. It does not seek to replace poor residents with wealthier residents. Revitalization simply seeks to improve or "bring life" to a community. Alternatively, while gentrification also has the end result of improving a community or neighborhood, it does so by displacing the poorer residents with wealthier residents (Kennedy and Leonard, 2001). Additionally, the general culture of a neighborhood is often altered when

gentrification occurs. This difference is important for policymakers and administrators. Normatively, it is expected that primary public goals do not include the displacement of individuals in the process of development. However, in reality, the revenue benefits to be gained from replacing poorer residents with wealthier residents can sometimes overshadow the values that many hope their public officials have. In many communities, there is evidence of gentrification where revitalization was the goal. When gentrification has occurred, the previous residents are simply displaced to another location and are not necessarily direct recipients of any of the benefits associated with the new economic transformation.

Gentrification and Denver, Colorado

Denver, Colorado, has experienced problems with gentrification in many of its previously declining neighborhoods. Central Denver has made a remarkable change in the last several decades. In 1958, the city created the Denver Urban Renewal Authority (DURA) (Renew Denver, 2008). At this point in Denver's history, housing was in shambles and revitalization was identified as a priority for the city. By the 1970s, DURA was focused on a long-term revitalization plan for the declining downtown. During this time, a large part of downtown was referred to as "skid row" and was populated by porn shops, bars, drugs, and pawn shops (Denver History Tours, 2008; Renew Denver, 2008).

One of the first controversial projects that could be characterized as a form of gentrification was with the Skyline Urban Renewal Project in the early 1970s. This project used federal money to demolish blighted buildings, relocate approximately 1,600 individuals and 95 families, and ultimately redevelop the area. Most of the residents were jobless and poor (Renew Denver, 2008). At the end of this project, more than 1,700 residential units were constructed and by all accounts this area has transformed into one of the most desirable in the city of Denver. "After several decades of gradual renovation and gentrification, LoDo has become one of Denver's hottest residential neighborhoods" (5280 The Denver Magazine, 1996). The median value of a residential unit in this "hot" neighborhood now rests at $483,800 (U.S. Census Bureau, 2010). Although this *revitalization* can be viewed as a success in many ways, what is largely missing is an accounting of those residents displaced by the revitalization. While this neighborhood certainly has "new life," only the wealthiest of Denver now live in this neighborhood.

Gentrification and Lubbock, Texas

A more recent example of redevelopment and revitalization contributing to gentrification can be seen in Lubbock, Texas. The Overton neighborhood in Lubbock sits adjacent to Texas Tech University. By all accounts, at the turn of the twenty-first century, this neighborhood was blighted. Homes were in disrepair and crime was

a significant problem for the city. A large portion of the neighborhood consisted of rental properties that lacked basic upkeep. A private developer took on the task of redeveloping this neighborhood by purchasing properties and land in this neighborhood with the ambition to redevelop it into a thriving, revitalized neighborhood. Although most of the purchasing of properties went smoothly, on at least four occasions, eminent domain was threatened to secure the necessary property for the redevelopment (Hunt, 2009). Additionally, the developer petitioned, and was granted, a tax increment financing district (TIF) to help finance the redevelopment. Presently, this development is almost entirely built out and many argue that it has displaced the lower income renters in favor of higher income residents. Additionally, some have credited this project with increasing the homeless population in Lubbock as a result of the decline in the availability of lower income rentals (Blackburn, 2011). On a positive note, however, is that the redevelopment has improved the image of the neighborhood and, by some accounts, the university. These improvements may have larger positive economic impacts on a city.

The line between gentrification and revitalization can be quite blurry in some cases. Additionally, it is reasonable to argue that gentrification of some neighborhoods has a significant positive economic impact on a wider community. However, when approaching revitalization, it is very important to take into consideration lower income populations that may be displaced by revitalization and redevelopment efforts. Finally, some cities (Denver is a key example) have engaged in a large-scale revitalization effort that may have included some problems with gentrification, but that also had successes with mixed-income revitalization efforts.

Development and Grayfields

Grayfields are not easily classified into a single typology as they are diverse in terms of size, location, and level of existing development. They can range in size from the very small to the very large and are located in groups along a major transportation corridor or dispersed throughout a city with little or no continuity. Some of the more usual grayfields include old indoor retail malls, old strip malls, and old big box stores. As mentioned previously, grayfields have several key benefits to them: well-established infrastructure, higher population density, locational benefits (transit stops, transportation patterns), and a relatively large size in a developed area (the average grayfield is 45 acres) (Chilton, 2004; Opp and Osgood, 2011).

The key to being successful in redeveloping a grayfield is creativity. Unfortunately, many cities only view a grayfield as what it originally was. That is, a mall is only a mall, nothing else. A big box store is only a big box store, nothing else. Additionally, the private sector owners of grayfields often attempt to compete with other retail establishments by spending "millions of dollars [on] rehabili[tating] malls through facade changes and the addition of new vendors" (Chilton, 2004, 7).

In Fort Collins, Colorado, the only local indoor mall has been struggling with this very issue for years. In the mid-1990s, the Foothills Fashion Mall was a thriving

and vibrant indoor retail shopping mall in the heart of Fort Collins. In 2002, the mall brought in approximately $4 million in sales tax revenue for the city (Ferrier, 2012). However, over the course of the next decade several changes occurred that led to the property being labeled as blighted. Specifically, Fort Collins' population center began to shift southeast, nearby cities began attracting retail business away from Fort Collins with new, outdoor shopping experiences, and major anchor stores in the original mall either filed bankruptcy or relocated closer to the population growth. As of 2012, the mall brought in only $2 million in sales tax revenues for the city and had over 30 vacancies (Ferrier, 2012). Arguably one of the biggest problems with this grayfield property has been the desire to keep this property as an indoor walking mall and the lack of creative alternatives for the area. Efforts to revitalize this property by the private owners of the mall and the city have been unsuccessful to date.

In some cases, a grayfield may be located in the middle of a declining section of town and the biggest impediment to revitalization is the piecemeal method that some cities take with their redevelopment efforts. For example, rather than focusing on one specific grayfield (which may be the biggest problem in the area), a wider effort can be made that takes into consideration the entire declining area. In many cases, the grayfield may be a product of, or exacerbated by, the decline of an entire neighborhood. In this case, revitalization will only be successful when a bigger picture view is taken by the participating parties. Returning to the city of Fort Collins as an example illustrates this concept in action. In addition to the decline of the Foothills Fashion Mall in central Fort Collins, a nearby strip mall called the University Mall faced a similar decline and blight. As of 2010, the commercial corridor that encompasses the Foothills Fashion Mall and the University Mall held 83% of the total vacant retail space in the city (Tatti, 2010). Grayfields in this area included a former Walmart, JC Penney's, Toys R Us, Circuit City, Linens 'n Things, and Wild Oats (Tatti, 2010).

In the past few years, the city has embarked on a wider scale effort to revitalize and redevelop this area. In addition to large-scale efforts to revitalize the grayfields, transportation improvements are planned to include new bike paths and public transit stops. This transit improvement is expected to draw from the tens of thousands of students who attend Colorado State University just a few miles north of this area. To date, this wider, more comprehensive view of the grayfield problem in Fort Collins has led to some significant successes. The University Mall portion of the corridor now boasts a Whole Foods, Wilbur's Total Beverage, and a Fitness Center (Tatti, 2010). Following in the footsteps of this success, many developers have elected to purchase or lease and locate in some of the smaller grayfields in this corridor. Many of these developers even credit the larger scale view and redevelopment efforts as being an important factor in their location decision. "Developer Les Kaplan picked up the former Kelley-Moore Paint Co. at 2101 S. College Ave last year … [the] … acre-and-a-half lot was attractive to Kaplan as an investment, not only because of the nearby anchor stores, but also because of the soon-to-come

amenities" (Tatti, 2010, 2). Furthermore, these developers credit the existing infrastructure as a positive aspect to locating in this area. This comprehensive view of the area has certainly helped draw in development that was previously reluctant to locate in this declining portion of the city.

Ultimately, in some cases, demand and needs in a community may actually require that the grayfield remain the same purpose as it previously was, thereby limiting creative options available to the city. However, in many other cases, a community can best revitalize an area by being innovative and thinking outside the box about a new use for a grayfield. A former Walmart building could become a church as it did in Greenfield, Wisconsin (Stewart, 2012). A former shopping mall could become a mixed-use residential, office, and retail development as it did in Lakewood, Colorado (Opp and Osgood, 2011). Reforming zoning codes to allow residential and commercial developments to co-exist can create a new vogue place for college students to live. Working on compact development efforts and styles in some grayfields also can help realize potential in some sites. "… distinct districts and neighborhoods, edges, nodes, landmarks, paths, and narrow streets with short blocks give a city or suburb identity and encourage pedestrian traffic" (Daniels and Daniels, 2003, 376). Finally, many of the traditional economic development tools of incentives, flexible zoning codes, and favorable regulatory processes could all be used to help transform a grayfield into the next great development opportunity in a community.

Development and Brownfields

Most often brownfields are more difficult to develop than grayfields or greenfields due to the concern over environmental contamination and liability. Past laws, namely CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act, 1980), posed very real liability concerns over the ownership of contaminated property (Opp and Hollis, 2005). However, in recent years, the federal government and all state governments have sought to ease the liability and financial problems associated with redeveloping brownfields. All 50 states and the federal government now have a program specifically dealing with liability, funding, and resources to encourage development on brownfield properties (Opp, 2009).

Like grayfields, brownfield properties can be viewed as an opportunity for the interested local administrator. Prior to redevelopment, brownfields do nothing more than create problems for a community. It is not uncommon for brownfields to have physical and health hazards that can seriously impact an area's property values and external perception. In an ideal scenario, the responsible party for the contamination would remediate the site and leave it ready for new development. However, more often than not, these brownfields become burdens of the greater community through abandonment or tax foreclosure.

In order to fully invest in these properties the local administrators and policymakers must understand the liability and financial issues associated with

contaminated properties. The grave concerns over liability that previously stigmatized these properties are still very real to many developers. Local administrators must be prepared with legal and environmental knowledge related to the brownfield sites in their community. As mentioned previously, all 50 states have a brownfield program and a majority of these programs have liability waiver provisions for the innocent developer. Chapter 11 goes into more detail on these state and federal programs. Additionally, many states and the federal government routinely offer financial incentives to conduct site assessments as well as some remediation of brownfields. It would be beneficial to the development efforts to understand the contamination that actually exists on a site and to be well educated in the resources available in your state.

More specific activities that a local administrator can engage in to encourage development on brownfields (and grayfields, in some cases) include creating an Internet information clearinghouse, piggybacking, tax increment financing (discussed in Chapter 9), zoning incentives, and land assembly. The simplest, and perhaps least expensive, action a city can take is to simply be a provider of information to developers concerning brownfields. Having informational brochures highlighting the benefits available for developing brownfields can go a long way in encouraging remediation and redevelopment of a brownfield. Taking this farther and providing an Internet resource that highlights the financial and liability provisions of the state brownfields programs as well as an overview of available incentives also can help a developer overcome his/her reluctance to invest in certain properties.

Piggybacking is also a way to pursue brownfield remediation and redevelopment. Piggybacking is simply the focused effort to pair a brownfield remediation and redevelopment with other development that is occurring in a community. For example, if a community is undergoing a large transportation improvement using federal and state transportation funding, it could explore as well piggybacking a brownfield onto that project. This piggybacking method has been used with success across the United States. For example, in Lawrence, Massachusetts, this technique was used to successfully remediate a brownfield (Opp and Osgood, 2011). If a city is able and willing to assist with the remediation of the contamination on a brownfield, then the site will look far more attractive to a would-be developer.

Zoning incentives, tax incentives, and other upgrades to an area surrounding a brownfield also can all help a community in its revitalization efforts (Opp and Osgood, 2011). These incentives must be structured in a way that encourages appropriate development and protects the city's interest in revitalization of the area. Another often overlooked issue that can have great success in encouraging revitalization and redevelopment of brownfield properties is that of crime. Often crime can be a bigger barrier to revitalization than the presence of brownfields (Porter, 1997). Local administrators need to view the issues in a declining area from a system-wide lens not just from a specific site view.

A final strategy that can aid in the revitalization of areas with brownfields is that of land assembly or regional clusters (Porter, 1997; Opp and Osgood, 2011).

Land assembly involves making smaller parcels of land in an area and piecing them together to help minimize the remediation costs of a brownfield as a percentage of the overall redevelopment project. This can often be an important consideration when developers are relying on financial institutions for funding. Finally, cities can identify and capitalize on specific regional clusters or business strongholds to improve the marketability of a specific site.

Anticipatory Development

Unlike revitalization efforts, anticipatory development efforts generally focus on greenfield sites. These efforts can be directed to help a city promote infill development rather than sprawling development. Although revitalization or remedial development is generally going to have a larger impact on improving and protecting the environment and quality of life in a community, anticipatory development also can be approached from an environmentally conscious angle. Specifically, mixed-use developments, affordable housing, urban growth boundaries, and low-impact development are all methods that can be used to help balance environmental and economic concerns when engaging in anticipatory development.

Mixed-Use Development

Mixed-use development can be defined as development that is mixed in purpose and income (Talen, 2009). Traditionally, as cities and metropolitan areas sprawled out from the central city, new development was designed to be single purpose and separate. By encouraging and facilitating mixed-use development, a city will achieve several important benefits that can help a community achieve a more sustainable economic development path.

Two major pathologies associated with single-purpose developments include income segregation and automobile dependence. When development in a city is separated and divided by type, residents are forced to rely on automobiles to get to their places of employment, shopping outlets, and public spaces. Furthermore, when development is segregated by income, differing quality of public schools may occur, opportunities for employment for certain populations may be limited, and exclusionary practices can be present (Talen, 2009). Mixed-use development, on the other hand, allows a resident to be less car dependent by virtue of the clustering of residential, commercial, open spaces, and sometimes industrial developments. It also can include a mixed income component to diversify income types of residents in a neighborhood. Cities can elect to encourage mixed use and mixed income by favorable zoning variances or they can force this type of development as part of their comprehensive planning process.

Affordable Housing

As discussed above, gentrification can be a problem in revitalization efforts. However, income and residential segregation can create pockets of wealth and pockets of poverty in newer developments as well. "Traditionally, low-income people have been more likely to live near hazardous sites and in poorly maintained buildings" (Daniels and Daniels, 2003, 377). A progressive city can help avoid some of the pathologies associated with residential and income segregation by encouraging, or even mandating, affordable housing be part of some or all new developments. Successes have been seen with affordable housing policies across the country. For example, in Montgomery County, Maryland, developers that construct a residential unit with more than 50 units must dedicate 15% of the units to affordable housing (Daniels and Daniels, 2003). A city that actively seeks to balance income types in development will likely see fewer negative externalities that often stem from income segregation: educational quality will be more consistent, crime pockets will be less prevalent, and service delivery will be more evenly distributed across a community.

Growth Boundaries

Creating a growth boundary is one of the most radical ways to minimize greenfield development. A growth boundary usually involves creating an agreement between the city and county to reserve a specific area for greenspace and allowing no new development in this area (Daniels and Daniels, 2003). These growth boundaries essentially force development to take place within the central part of a community rather than sprawling to the peripheries. These boundaries can curb sprawl, reduce infrastructure costs, and preserve natural spaces. However, these boundaries can be very contentions, can cause home prices to explode, and often require multiple layers of permission. Some also argue that growth boundaries actually cause additional sprawl by encouraging leapfrog development even farther out from the city center.

Low-Impact Development

Low-impact development (LID) is a relatively new phenomenon that deals with using technology to protect the environment and reduce infrastructure costs in development (NAHB Research Center, 2003). LID technologies are very diverse and include both structural and nonstructural methods. Developers that engage in low-impact development are generally trying to do the following: preserve open space, protect sensitive natural features, identify and link green infrastructure, incorporate natural features into designs, and better manage stormwater (NAHB Research Center, 2003). Low-impact development techniques have been particularly successful for stormwater management issues in new developments.

One of the biggest challenges a city faces when developing their greenfields is the far-reaching impact to the environment of the addition of so many impervious surfaces. Using low-impact development technologies for stormwater management helps protect waterways, habitats, and groundwater (DeLaria, 2008). LID practices are usually most successful for new residential development in a city (NAHB Research Center, 2003). As part of the development approval process, a city can encourage developers to utilize LID technologies for stormwater management in the process of development. While conventional systems rely on collection systems to protect from flooding issues brought on by the increase in impervious surfaces, LID techniques can actually have a cost-savings benefit, aesthetic improvement, and environmental protection benefit for all involved parties. (For a general overview of some of the cost savings that can result from using LID techniques, see EPA (2007).)

LID technologies and techniques vary significantly across regions and types of development. However, what is central to all LID techniques and technologies is the proactive effort to design systems that are more environmentally conscious when developing new areas in a city. LID practices will use new design techniques to preserve and protect natural resources and minimize land disturbances. (See NAHB Research Center (2003) and DeLaria (2008) for more detail on specific techniques used in LID.)

Conclusions and Concepts in Action: New Hanover County, North Carolina

Sustainable economic development efforts often begin with revitalization and redevelopment. However, as discussed above, sustainable economic development also can be pursued with anticipatory or new development. While the previous sections of this chapter provide good insights to the local administrator, the case example that follows provides additional insights directly from someone that participated in the use of low-impact development in Wilmington, North Carolina.

SUSTAINABILITY AND THE BUILT ENVIRONMENT: LOW-IMPACT DEVELOPMENT

North Carolina has over 300 miles of coastline, and the population of the state's 20 coastal counties exceeds 800,000 people. Not only is the North Carolina coast a popular location to live, it is also a premier tourist destination, with the economic impact of tourism at over $2 billion annually. Therefore, water quality that meets the designated standards, thriving fisheries and shellfisheries, and beaches that are open to swimmers are important

factors to sustaining the quality of life and continued economic growth in these coastal areas. One of the most densely populated regions of coastal North Carolina is southeastern North Carolina. Wilmington is the metropolitan center of this quickly urbanizing area, which is located in New Hanover County, with Brunswick County just to the south. The two counties experienced unprecedented growth in the 1990s and early 2000s. Coupled with this growth was a steady decline in some of the area's fragile natural resources, specifically, surface water quality with the greatest amount of pollution coming from stormwater runoff.

Stormwater Management Techniques

It has been demonstrated that traditional development practices increase impervious areas, thereby decreasing the land's ability to infiltrate water. Though the magnitude of the result is site-specific, the increased volume of runoff and peak discharges can be substantially greater than predevelopment conditions. The increased and new pollutant quantities that are carried by stormwater enter into receiving waters, carrying with them bacteria, nutrients, metals, and other pollutants. Ironically, many of these adverse impacts are not inevitable, but occur as a result of the methods used to collect, convey, concentrate, and treat runoff in a manner that creates a highly efficient drainage system. The more efficiently the drainage system moves water away from the site, the greater the cumulative impacts that often can be seen. These cumulative impacts often lead to flooding, erosion, and water quality degradation.

Low-impact development (LID) technology provides additional tools designed to optimize the use of the urban landscape. It is an approach to site development and stormwater management that emphasizes the integration of site design and planning techniques that conserve natural systems and the hydrologic functions of the land. The LID approach is focused toward restoring and optimizing the land's ability to absorb water by capturing pollutants and then filtering them through the landscape. It is a decentralized approach where many small-scale techniques are distributed and integrated throughout the site to retain, detain, treat, and utilize runoff in a manner that more closely mimics the natural water balance of the land in its predeveloped condition.

Encouraging LID in New Hanover and Brunswick Counties

In an attempt to address stormwater pollution, LID was brought forward to regulators in southeastern North Carolina as a concept that could be utilized in place, or in coordination with, conventional stormwater management techniques. Through a project funded by a grant from the National

Oceanic and Atmospheric Administration (NOAA), several public and private partners including Brunswick County, New Hanover County, the City of Wilmington, North Carolina Coastal Nonpoint Source Pollution Program of the Division of Water Quality, and the North Carolina Coastal Federation embarked on an effort to instill LID as a stormwater technology utilized by the majority when designing development projects in Brunswick and New Hanover Counties.

The ultimate scope of the project included the following:

1. Review of current ordinances to determine impediments to LID implementation.
2. Comprehensive review of LID principles and practices to determine appropriateness for coastal application.
3. Guidance on LID technologies compliant with local and state requirements.
4. Preparation of an LID manual and resolution to enable developers to use LID.
5. Distribution of educational and outreach materials.
6. Development of an LID spreadsheet modeling tool to aid engineers, planners, and developers with design and permitting of LID projects.

Larry Coffman, a national LID consultant, provided the initial technical support for the project. His support included a review of ordinances in place in the City of Wilmington and in Brunswick and New Hanover Counties in an effort to determine possible impediments for those attempting to design projects utilizing LID technologies. From this review, Coffman determined that each of the jurisdictions had development ordinances in place that largely did not provide obstacles for the implementation of LID projects. However, it was found that impediments could arise from North Carolina state-level transportation requirements for public roads as well as technical standards mandated by the local fire departments for road widths. It was decided by the committee that these issues would be addressed on a case-by-case basis.

After completion of the analysis of impediments, a local technical advisory committee (TAC) was formed and would continue to meet over the course of the next 1½ years. The TAC included representatives from the local homebuilders association, realtors association, engineers, contractors, environmentalists, nonprofits and educational institutions as well as staff from each of the three jurisdictions. With assistance from Coffman, the TAC first tackled the issue of how LID would be incorporated into government processes. Originally, the initial partners of the grant sought to mandate LID; however, members of the TAC quickly steered the conversation to more of

a voluntary approach. Concerns included a lack of knowledge within the permitting community about LID technologies; a lack of knowledge within the engineering, construction, and design community about LID design, construction, and maintenance; the uncertainty of additional impediments within the permitting process that could arise; and the cost of LID technologies. It was decided that the end result would be a LID manual spreadsheet modeling tool resolution of support from each of the local jurisdictions, and a series of educational workshops. The ultimate goal would be to encourage and allow for LID technologies as an alternative and voluntary option for developers to satisfy stormwater requirements and watershed goals, and no mandate would be included at that time.

Coffman prepared the initial work on the LID guidance manual and county and city planning staff completed the remainder of the work with the support and ongoing assistance of the TAC. The TAC continued to meet over the next year and a half to provide comments and input throughout all drafts of the manual. The end result was a LID manual that provides technical guidance on the application of LID principles, planning, and practices as an acceptable approach to meeting stormwater management objectives. Importantly, it was realized by the TAC very early in the formation of the document that efforts to protect or improve water quality could not be directed toward new development alone because much of the Wilmington and New Hanover County footprint was already developed. Impacts from existing stormwater pollution sources had to be addressed if water quality was to improve. To address existing development, a chapter of the manual was devoted to LID retrofitting. Case studies were provided from existing urbanized communities, with many of the case studies from Wilmington where the North Carolina State Biological and Agricultural Engineering staff had already implemented several LID retrofit pilot projects. Once complete and endorsed by the TAC, the manual was vetted through the local jurisdictions' political processes. At the same time the manuals were vetted through the political process, a resolution encouraging the use of LID in the region also was brought forward. Each of the governments signed these resolutions, thereby encouraging that LID be the preferred approach for stormwater management within New Hanover County, the City of Wilmington, and Brunswick County.

Simultaneous to the development of the LID manual, the TAC also oversaw the creation of a spreadsheet modeling tool that became known as the LID-EZ Spreadsheet. The impetus of the spreadsheet was to assist with the integration of LID technologies into projects within the region. The modeling tool was developed in order to provide an opportunity to submit the calculations necessary for permitting LID projects in one simple spreadsheet.

The tool quantified the effect of the structural and nonstructural Best Management Practices (BMPs) that make up a low-impact development on the overall hydrology of residential and commercial developments and then computed required storage volumes necessary to meet the local and state requirements.

A key component of this entire process was education. Education had to take place at the staff level, the members of the TAC had to be educated on many of the aspects of LID, politicians had to be educated about LID and area contractors, engineers and land planners also had to be educated. All of this had to take place before an attempt was made to take any part of the project through the political process. Mr. Coffman provided a great deal of expertise to staff and the TAC. Staff then educated the politicians. A series of workshops were held for local contractors, engineers, and land planners to be educated as well about LID technologies. The result was that each of the jurisdictions voted unanimously to support the documents as presented.

The Economics of LID

When LID was first being introduced to the steering committee and area regulators, one of the biggest concerns was the cost. Many assumed that, as with most technologies labeled as green or sustainable, that utilizing the techniques put forward in the LID manual would be more costly. However, after review of studies conducted by the Environmental Protection Agency and North Carolina State Biological and Agricultural Engineering Program to determine the economic efficacy of LID, it was clear that this was not likely true. In order to bring that realization to area regulators and building professionals, a local study was needed as a focal point for the community. The local study was found in a development known as Ridgefield. The land for this development is located in unincorporated New Hanover County. The developer of the project had a previously approved stormwater design for a 56 single-family lot subdivision that had already been permitted through the local agencies; however, construction had not commenced on the project. The previously approved stormwater design utilized an extreme amount of conventional stormwater management techniques in order to move water quickly off the property. The design included a great deal of stormwater infrastructure that added a large expense to the project. The developer read about LID in a newspaper article that featured a local subdivision that had won an award for its environmental stewardship by incorporating a few LID technologies. The developer became intrigued and educated himself on LID technologies. He was most interested in the fact that LID technologies called for the infiltration of water onsite, rather than directing the water off the property with

stormwater infrastructure. He decided to hire the local landscape architect/engineering firm that had designed the award-winning project in order to redesign the Ridgefield project utilizing LID technologies. The firm took the original design and reworked it, utilizing LID techniques. The result was the following:

- An 89% reduction in stormwater pipes
- A 9% decrease in road width
- The deletion of 9,000 feet of curb and gutter
- The elimination of three infiltration basins
- The elimination of three stormwater pumps and a forced stormwater main that were designed to pump water from the extremities of the subdivision into the stormwater ponds
- The reduction of a need for the majority of fill material that was proposed to be utilized
- A 53% increase in land available for open space
- A reduction in the limits of disturbance for the development by 18%
- Available land for four additional lots

The cost savings to the developer with this new design incorporating the LID technologies and eliminating the need for the extraordinary amount of stormwater infrastructure was greater than $1 million. This amount did not account for the four additional lots that were gained as a result of the LID redesign, which also would increase the developer's ultimate profit on the project. A number of factors in the redesign also could potentially increase the value of the homes to the potential buyer including the increase in the number of trees that were able to be saved in the new design, the increase in the amount of open space, and the desire to live in a "green" neighborhood.

Conclusion: Lessons Learned

New Hanover and Brunswick Counties and the City of Wilmington have all experienced a greater desire from the development community to instill LID practices into project designs. As a result, there has been a marked increase in the number of subdivision and commercial project designs utilizing LID techniques. This increase is without any major incentives offered to the developer by the local government. The largest factors that can be attributed to this are (1) a documented degradation of area water quality and the strong community desire to improve the current state of the quality of waters, (2) the education that took place throughout the process that helped to diminish the uncertainties or concerns that were amidst within the development

community and that brought the local permitting agencies up to speed on LID technologies, and (3) the local project that was utilized to feature the economic benefits of LID. These factors helped to create a hospitable environment for the successful inclusion of these cutting-edge, green technologies into local programs without the need for additional incentives.

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Chapter 3

Energy, the Environment, and Economics

Energy plays a central and critical role in many aspects of the American way of life. Energy also has an impact on a city's ability to attract and retain businesses. Due to the importance of energy to all Americans, it tends to be a topic that evokes extreme feelings and opinions (Browning, 2009). For the better part of the twentieth century, Americans enjoyed abundant and inexpensive energy. However, this time of cheap and abundant fuel, sometimes called the "fossil fuel era," is believed to be at, or near, its end (McNerney and Cheek, 2012). In fact, a surging body of literature outlines the theory of peak oil; the idea that, globally, we have already hit the peak of oil production and will soon face devastating economic consequences as oil production declines to the point of nonexistence (Smil, 2010). While there is some debate about the accuracy of peak oil projections, it is certain that dealing with the increased costs, decreased supplies, and environmental impacts of a reliance on fossil fuels has prompted citizens and governments alike to begin exploring alternatives to the traditional nonrenewable energy sources (Daniels and Daniels, 2003). The support for alternative energy sources is generally shared across the political and economic spectrum in the United States. Complex and interrelated issues of cost, environment impacts and security makes alternative energy sources attractive to a diverse subset of Americans.

For some Americans, the price of operating their private vehicles to simply get to work has become high enough to cause economic concerns or hardships. In fact, according to a March 2012 nationwide poll by the University of Texas, 81% of those responding indicate that gasoline prices are "too high." In this same University of Texas poll, another 59% believe that gasoline prices will increase

significantly in the next six months and 76% of households expect the amount spent on energy as a proportion of their budget will increase over the next year (University of Texas at Austin, 2012). Naturally when Americans are spending a greater share of their disposable incomes on gasoline, they will have less ability to consume in other areas. This has real implications for the broader economic condition of many communities.

In addition to the basic cost concerns associated with energy, many Americans also are worried about the pollution created by a reliance on *dirty* fossil fuels. As Americans continue to be concerned about the natural environment, the demand for expanded clean energy sources also will continue to increase. In the same recent poll, 65% of respondents believe global climate change is occurring and that one of the biggest contributors is the burning of fossil fuels for energy (University of Texas at Austin, 2012). All of the traditional nonrenewable energy sources have environmental consequences that involve tradeoffs.

To many policymakers, public sector agencies, nonprofit administrators, citizens, and scholars, clean renewable energy coupled with greater energy efficiency is believed to be the primary solution for most of the ill effects of the dependence upon fossil fuels (Shuford, Rynne, and Mueller, 2010). However, at the same time, when asked about the importance of environmental protection versus economic growth, 41.9% of Americans indicate that economic growth is preferred to environmental protection, while only 30.3% indicate environmental protection is more important than economic growth (University of Texas at Austin, 2012). Given this divide, as well as the importance of energy to the American way of life, this chapter will focus on the intersection of energy and environment to offer insights and options for local governments across the United States. In order to accomplish this task, this chapter will first provide an overview of the current state of energy usage and energy sources in the United States, will then turn to an exploration of clean energy, and, finally, conclude with an example of these topics in practice in Portland, Oregon.

Current State of Energy in the United States

The United States has five primary sources of energy: coal, petroleum/oil, natural gas, nuclear, and a combination of several renewable sources (Daniels and Daniels, 2003; Energy Information Administration, 2012b). In 2011, energy use in the United States equaled approximately 97.5 quadrillion BTUs (EIA, 2012b). For comparison's sake, 1 quadrillion BTUs is equal to "… the amount of energy in 45 million tons of coal or 1 trillion cubic feet of natural gas or 170 million barrels of crude oil" (Wilcoxen, 2009). Of this total energy usage, the largest percentage, 39.6%, is dedicated to electricity, followed by transportation at 26.9% (EIA, 2012b). In simplest terms, America's energy sources can be categorized into two groups: nonrenewable and renewable. According to the Energy Information

Administration (2012a), in 2011, renewable energy only accounted for approximately 9% of all energy sources in the United States (Figure 3.1).

Nonrenewable Energy Sources

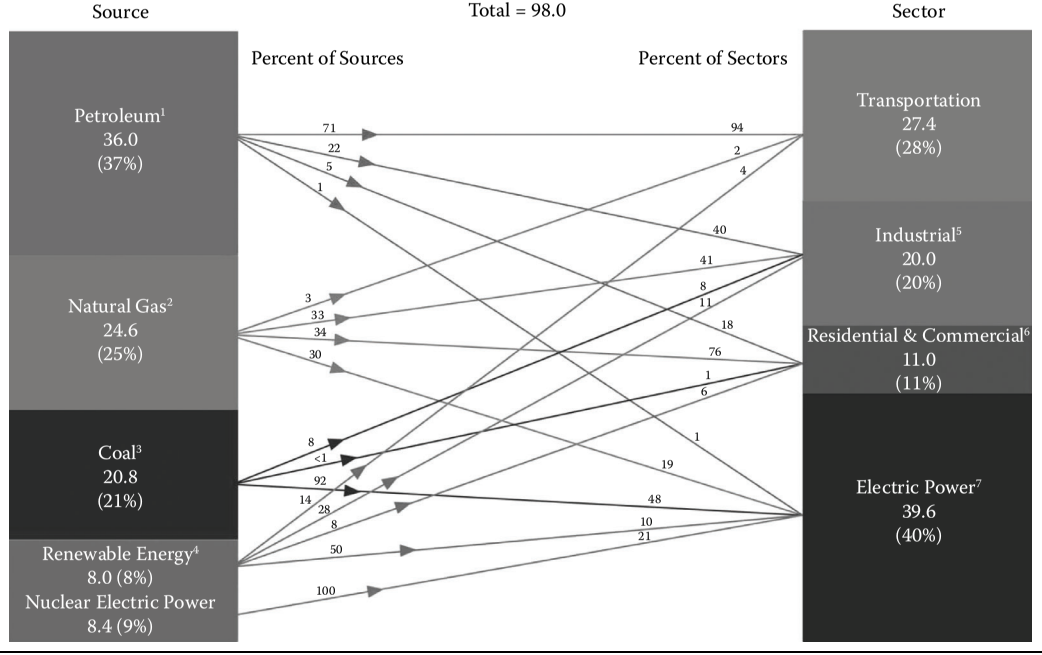
The primary nonrenewable energy sources used in the United States include petroleum/oil, natural gas, coal, and nuclear (Daniels and Daniels, 2003). Each of these sources has its own unique problems that will be highlighted in the following sections in order to better understand the complexity of the issue as well as the difficulty of a solution.

Petroleum Issues

Petroleum makes up the largest source of energy use in the United States at approximately 36% (EIA, 2012b). Petroleum also has some of the most complex issues associated with it. Economic, political, and environmental problems are all present in the use of petroleum products for energy. Two of these problems, economic and political, also are directly related to the foreign dependence for a large share of the American petroleum supply.

In 2011, the United States imported approximately 45% of all of the petroleum consumed during that year (EIA, 2012a). Although this percentage has slowly declined in recent years, America still has a substantial reliance on resources outside of the direct control of the United States. It is estimated that almost 60% of the 2011 trade deficit can be attributed to imported petroleum supplies (Consumer Energy Alliance, 2012). Fluctuations and disturbances in the price and supply of petroleum can have far-reaching consequences for American citizens. According to the U.S. Census Bureau (2009), approximately 80% of workers aged 16 years and older commute alone to work in a personal vehicle. Furthermore, approximately 94% of the transportation sector is fueled by petroleum (EIA, 2010). Given the overall dependence upon personal transportation, it is easy to understand why so many Americans are impacted by and concerned with any changes in petroleum supplies and prices. In fact, Mark Zandi, an economist at Moody's Investor Services says that gas prices are "… the most serious immediate threat to consumer confidence and the broader economy" (Reagan, 2012). As the percentage of a household's discretionary income dedicated to basic energy costs rises, many households will have to cut back on other expenditures. These cutbacks can have significant consequences in other parts of the economy.

Thinking about foreign petroleum dependence in broader terms also reveals some serious national security risks. At minimum, American foreign policy tools are impacted and limited by dependence on foreign petroleum supplies. The petroleum exporting nations enjoy large revenues from overseas petroleum purchases and are able to (and often do) pursue policies and activities that are not in the best interest of the United States. Furthermore, other energy dependent countries, such



[1] Does not include biofuels that have been blended with petroleum—biofuels are included in "Renewable Energy."
[2] Excludes supplemental gaseous fuels.
[3] Includes less than 0.1 quadrillion Btu of coal coke net exports.
[4] Conventional hydroelectric power, geothermal, solar/PV, wind, and biomass.
[5] Includes industrial combined-heat-and-power (CHP) and industrial electricity-only plants.
[6] Includes commercial combined-heat-and-power (CHP) and commercial electricity-only plants.
[7] Electricity-only and combined-heat-and-power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public. Includes 0.1 quadrillion Btu of electricity net imports not shown under "Source."

Notes: Primary energy in the form that it is first accounted for in a statistical energy balance, before any transformation to secondary or tertiary forms of energy (for example, coal is used to generate electricity). • Sum of components may not equal total due to independent rounding.

Sources: U.S. Energy Information Administration, Annual Energy Review 2010, Tables 1.3, 2.1b-2.1f, 10.3, and 10.4.

Figure 3.1 Primary consumption by source and sector, 2010. (From U.S. Energy Information Administration's Annual Energy Review 2010: Tables 1.3, 2.1b/f, 10.3, and 10.4.)

as China, may engage in policies that seek to secure favorable supplies of petroleum at the expense of greater worldwide security (Victor, 2006).

In addition to the economic and political issues associated with petroleum, the environment also is negatively impacted by petroleum exploration and usage. All phases of petroleum exploration and consumption have environmental consequences. Production, whether domestic or abroad, requires a variety of activities that results in environmental harms. For example, drilling for oil on land or in water causes many negative externalities, such as "… deforestation, ecosystem destruction, chemical contamination of land and water, long-term harm to animal populations (particularly migratory birds and marine mammals), human health and safety risks for neighboring communities and oil industry workers, and displacement of indigenous communities" (O'Rourke and Connolly, 2003, 594). In addition to these harms, the process of exploration and drilling for petroleum can generate solid and hazardous wastes, which must then be disposed of properly to avoid further environmental harms. Finally, the usage of petroleum for a large percentage of American transportation contributes to greenhouse gas emissions (discussed later). Given the overall relationship between all fossil fuels and climate change, a separate section for climate change and energy will be highlighted later in this chapter.

Natural Gas Issues

Unlike petroleum-based energy, natural gas is generally viewed more favorably by Americans. One positive aspect of natural gas is that it is much cleaner burning than petroleum or coal (Daniels and Daniels, 2003). Additionally, natural gas reserves are plentiful causing many to brand natural gas the *bridging fuel* from the dirty fossil fuels to cleaner energy sources. While natural gas does produce far less carbon dioxide emissions than do the other fossil fuels, it still has environmental problems that must be mentioned. Two of the biggest problems with natural gas deal with methane emissions and the method of extraction (specifically hydraulic fracturing or fracking) for natural gas.

Methane

Methane is a greenhouse gas that is considered about 20 times more effective in trapping heat than carbon dioxide (EPA, 2011). While it is known that methane is being emitted from natural gas sites, it is still unknown exactly how much is escaping. In one study conducted by the National Oceanic and Atmospheric Administration (NOAA), it was discovered that one natural gas producer in an area north of Denver, Colorado, was losing about 4% of the gas into the atmosphere (Tollefson, 2012). This was more than twice as much as expected. Given the magnitude of heat trapped by methane, this leakage will have far greater impacts on climate change than will similar carbon dioxide emissions from burning other

forms of fossil fuels. Looking to the future, it is inevitable that policies will need to be created to regulate and ensure methane emissions are limited if Americans are to see natural gas as a viable environmentally friendly alternative to petroleum.

Fracking

Fracking, or hydraulic fracturing, is perhaps becoming more visible than the methane problem in the environmental discussion concerning natural gas. Fracking is a "… drilling technology that uses a mix of water and chemicals to dislodge natural gas from deep shale or coal bed methane deposits" (Davis, 2012, 177). As the demand for natural gas continues to increase, many energy companies are seeking out methods to extract additional resources, with fracking being one of the most used and controversial methods. The economics versus environment debate is very present in the politics of fracking. A simple Internet search for the terms *fracking* and *jobs* will reveal millions of Web sites discussing the benefits of fracking as it relates to the potential for new and high-paying jobs. As a specific example, fracking jobs in Pennsylvania average approximately $62,000 a year, almost $20,000 higher than the average pay in the state (Pennsylvania Fracking, 2012).

While natural gas jobs are certainly beneficial to many communities, there are a number of yet unanswered questions surrounding the environmental harms associated with fracking. In fact, some of these concerns have led states and cities to enact moratoriums on fracking (Davis, 2012). Some of the major environmental concerns with fracking include the use of toxic chemicals, explosions, wastewater, chemical spills, noise pollution, and earthquakes (Environmental Working Group, 2012; Rascoe, 2012). Additionally, it appears that fracking has some NIMBY-ism (not in my backyard) attached to it as well. In many communities, residents are outraged by the use of fracking techniques near, or in some cases, under their homes and communities (Adair, 2012). As natural gas becomes increasingly more relied upon, fracking is something that will need to be further investigated before communities can adequately assess the appropriateness of this technology for their economic development and job growth efforts.

Coal Issues

Like natural gas, coal is often viewed as a viable resource to solve some of the concerns over energy independence and cost. In fact, the United States has one of the largest coal reserves in the world with estimates as high as 4 trillion tons (Daniels and Daniels, 2003; National Research Council, 2007). With this large supply of coal comes the opportunity for economic growth. However, coal is not without its own set of problems. These problems range from transportation and delivery to environmental degradation issues.

Although the United States has an abundant resource in coal, the extraction of coal is a difficult, expensive, and dangerous process. Coal can be extracted through

two primary methods: underground or surface (National Research Council, 2007). Although the method of extraction is dictated by economic and technical attributes, approximately 60% of coal mining is accomplished through the underground method (National Research Council, 2007; World Coal Institute, 2009). Some of the major environmental impacts of coal mining include noise pollution to neighboring developments, air pollution from dust and particulates, and acid mine drainage pollution to groundwater and surface water (Daniels and Daniels, 2003). In addition to the environmental harms from extraction, the act of mining for coal is a very dangerous profession (National Research Council, 2007). It is rare that a year passes where a coal miner is not killed doing his or her job. For example, in 2010, 48 miners died in coal mines in the United States (Huber, 2010). In addition to accidental deaths related to the process of mining, many miners suffer health impacts many years later—the so-called black lung issue. In some areas, coal mining is the largest, and perhaps only, industry available for employment opportunities for local residents, thereby forcing some people into a dangerous profession for the sake of their livelihood. Also due to the nature of the industry and the location of resources, coal mining is not going to be something that many communities can capitalize on as part of their economic development efforts.

Transporting and ultimately burning coal as an energy source also exhibits several difficulties and negative externalities. First, the transportation of coal from a mine to a coal-fired electric facility is a cumbersome and often expensive process. Approximately 64% of coal shipments are transported by railroads (EIA, 2007). In recent years, the cost of transport by rail has steadily increased while reliability has decreased (National Research Council, 2007). Second, the burning of coal causes harmful emissions of nitrogen dioxide, sulfur dioxide, and carbon dioxide (Daniels and Daniels, 2003). Nitrogen dioxide and sulfur dioxide are both contributors to smog and acid rain (South Carolina Department of Health and Environmental Control, 2011). Furthermore, carbon dioxide is the primary greenhouse gas contributing to global climate change. From an environmental standpoint, these emissions are generally viewed as the most significant problem with burning coal for energy.

In recent years, there has been a lot of discussion surrounding clean coal technology and coal gasification technology. In fact, the federal government has administered a program titled "Clean Coal Technology" since the early 1980s (U.S. Department of Energy, 2011a). This program has documented several successes in reducing the environmental harm from the use of coal (Management Information Services, 2009). However, not all are in agreement concerning the reality of clean coal. Many scientists believe that there is no such thing as, or possible way to achieve, truly clean coal (Andrews, 2009). The answer to the emission problem with coal, some say, will be with carbon capture and sequester technology, a process still under development with an unknown time period for the ability to adequately implement it (U.S. Department of Energy, 2010).

The outlook for coal is less clear than the other energy sources. It is clear that coal is *not* a clean energy source. It also is clear that many externalities exist with the

production and use of coal. However, coal does have some positive aspects including employment opportunities and domestic production potential. The employment opportunities connected to coal mining are usually very high paying for those willing to accept the dangers associated with the profession. According to payscale.com (2012), the median yearly salary for a coal mine worker is $50,868. However, even with the potential benefits from utilizing coal, it is important to keep in mind that coal is a nonrenewable resource and will not be a permanent answer to the nation's energy needs. Furthermore, some of the environmental scars from the act of coal mining will remain for decades after the coal mine closes, thereby posing additional problems for many communities.

Nuclear Issues

Prior to devastating earthquake tsunami and subsequent nuclear catastrophe at the Fukushima Nuclear plant in Japan, nuclear power was viewed as a potentially viable and popular option to provide cleaner energy to the United States. However, this nonrenewable energy source also is fraught with issues that must be understood and acknowledged before viewing it as the answer to America's energy woes. The major issues with nuclear power include political NIMBY-ism, safety concerns, and environmental problems associated with the wastes produced by the spent nuclear rods.

According to the Energy Information Administration (EIA, 2012c), the United States currently has 104 nuclear reactors operating in 65 nuclear power plants across the country. These nuclear power plants exist in 31 states. One positive aspect of nuclear power is the virtual absence of carbon emissions from the production of energy using this source. While some level of emissions do exist in the process of preparing nuclear fuel for the reactors, it is relatively small compared to the other energy sources highlighted in this chapter (EIA, 2012c).

Several logistical issues plague attempts to expand nuclear energy in the United States. First, the costs of construction for nuclear power plants are in the millions, and sometimes billions, of dollars (Daniels and Daniels, 2003). Second, the regulatory structure controlling nuclear energy is extremely difficult and time consuming for interested parties. In fact, many decades have passed between approvals for new nuclear power plants. Third, hazardous wastes generated by nuclear power plants have serious storage, security, environmental, and health risks attached to them. The wastes from plutonium (where about one third of the energy in nuclear plants come from) remain active for thousands of years and require very secure storage methods to protect health and the environment (Daniels and Daniels, 2003). While Yucca Mountain (Nevada) was financed and built with the intention of providing some nuclear waste storage space for the hazardous waste, it has been embroiled in years of political turmoil and may never be used to capacity. Finally, the NIMBY phenomenon is very present in the discussion over nuclear power. While many may support the concept of nuclear power, most are not willing to have the facility or wastes in their community.

One important aspect of nuclear power that often gets missed in the energy debate is the fact that nuclear energy, like the other energy sources highlighted in the first sections of this chapter, is nonrenewable. The specific type of uranium, U-235, needed for nuclear power is a resource located in the Earth's crust and under the oceans. This type of uranium is very rare and must undergo a mining process with similar environmental harms to that of coal mining (World Uranium Association, 2012). The future of nuclear energy, by many definitions, is less optimistic or acceptable as an energy resource than is coal or natural gas.

Global Climate Change

Although climate change remains controversial to some people, it is something that must be discussed when thinking about energy. Climate change can be defined as a "… change in the state of the climate that can be identified (e.g., using statistical tests) by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer …" (Shuford, Rynne, and Mueller, 2010, 21). As mentioned earlier in this chapter, a majority of Americans believe that climate change is occurring and most say that deforestation and fossil fuel usage are to blame for it (University of Texas, 2012).

If some of the scientific predictions are accurate concerning climate change, then the United States faces a very uncertain and difficult future. Under the worst-case scenarios, the United States is expected to see significant increases in the average temperature, significant increases in the number of days with temperatures over 90 degrees Fahrenheit, significant increases in ocean temperatures and sea levels, extreme storms, and significant precipitation changes and drought (Shuford, Rynne, and Mueller, 2010). These consequences, even if not as severe as some predictions, will have far-reaching impacts for policymakers and administrators in American cities.

Renewable Energy Sources: Clean Energy

Currently, less than 10% of the energy used in this country comes from so-called clean or renewable sources. However, as energy prices and environmental concerns continue to grow, many are looking to expand renewable clean sources. Unlike the energy sources highlighted above, renewable energy sources can be sustained due to the ability to regenerate (EIA, 2012d). Although technically sustainable, these energy sources all have shortcomings that make it challenging to simply convert from currently used sources to these renewable, clean sources. Presently, the major renewable sources used in the United States include biomass/biofuels, water, geothermal, wind, and solar.

Biomass/Biofuels

Biomass is generally used to describe something living that is produced to generate energy (Renewable Energy Centre, n.d.). Across the world, energy has been produced from a variety of living organisms and by-products of living organisms including sugar, corn, willow, algae, and landfill gas. Biofuels are generally viewed favorably due to their reduction in greenhouse gas emissions and the renewable nature associated with the sources used to create them (U.S. Department of Energy, 2011b).

Biofuels have been promoted as an alternative fuel source for many years. In fact, Henry Ford was a great proponent of ethanol (Smil, 2010, 98). Today, biomass/biofuels continue to be a politically popular alternative energy source. Although federal support of biomass/biofuels is very widespread in active energy policy and in research funding, some scientists do not view biofuels as the solution to the energy problems in the United States. Specifically, some point to the impact on the price of food as the result of diverting corn from the food supply to the fuel supply (Mitchell, 2008); others discuss the greenhouse gas emissions and water use that occurs when biomass is grown to convert to energy (UNESCO, 2009). Still others point out the immense, and prohibitive, amount of resources required to actually supply the energy demand in the United States (Smil, 2010).

One new area of promising research in biofuels is that of cellulosic ethanol. To some researchers, the use of sugars from breaking down cellulose offers a better way to reduce carbon emissions and could be obtained from the almost 1 billion tons of unused and leftover parts of harvested crops (Smil, 2010). While some promise exists in this form of clean energy, much is to be done in terms of research and development to make this a viable alternative to traditional energy sources. This could be an area where local administrators can hope to see economic opportunities as research and development expands in this technology.

Water/Hydroelectric

Hydroelectricity is currently the largest producer of energy of all of the renewable sources. This type of power generation generally has several important benefits including minimal pollution, relatively low operation costs, and reliable technology (U.S. Geological Survey, 2012). However, like other energy sources, hydropower also has some shortcomings. There is some evidence that the hydroelectric dams used to produce the energy emit significant levels of carbon dioxide and methane (Graham-Rowe, 2005). Others have pointed to disruptions in animal populations as the result of hydroelectric dams (EPA, 2007). While hydropower has clear advantages, ultimately it is not something that can completely replace current energy sources.

Geothermal

Geothermal energy is energy captured from the heat within the Earth (EIA, 2012e). Currently, the United States has approximately 3,187 MW of geothermal-produced energy online (Geothermal Energy Association, 2012). Although this accounts for a very small amount of the renewable energy used in the United States, geothermal energy is expected to grow in usage in the coming years. Information on the availability and problems associated with geothermal energy is largely underdeveloped. However, by some accounts geothermal energy could be a good alternative to other renewable sources, like wind and solar, which are not always available for power generation. The biggest downsides to geothermal power are the costs associated with the technology needed to utilize the power and the potential for earthquakes (Levitan, 2011). Geothermal power has a long way to go before it can be viewed as a significant part of the solution for America's energy needs.

Wind

Wind energy is one of the fastest growing forms of renewable energy. Wind energy is essentially using wind flow to convert moving air into energy through wind turbines (Wind Energy Development Programmatic EIS, n.d.). In 2011, 36 states had large wind turbines generating significant levels of energy (EIA, 2012d). In general, wind energy is a very clean alternative to other forms of energy. However, some concerns with this form of energy include noise pollution, bird deaths, and some NIMBY-ism with the appearance of the turbines (Wind Energy Development Programmatic EIS, n.d.). Wind energy has some economic development possibilities that will be discussed later in this chapter.

Solar

Solar energy is essentially power created by harnessing solar radiation (EIA, 2012b). In recent years, government policy has encouraged the development and use of solar power as an alternative to the traditional fossil fuels. However, like all energy sources, some shortcomings exist with solar power. The primary concern with solar power is the waste involved in the production of the units used to convert solar radiation into usable energy. Specifically, mercury and chromium are two of the biggest toxic wastes generated in the manufacturing process for solar energy equipment (Underwood, 2009). Additionally some have expressed concern over the perceived inadequate life expectancy of the very expensive equipment required to harness solar power.

The Intersection of Economic Development and Energy: Using Clean Energy for Local Economic Development

Hopefully two things are clear after reading the overview of energy in America: energy is extremely complex and no one right answer exists. While each and every energy source has serious shortcomings, the public sector is still dedicated to encouraging clean energy sources as the problems with fossil fuels continue to be apparent. In recent years, the U.S. government has passed two large-scale pieces of legislation aimed at incentivizing clean energy. Both the 2005 Energy Policy Act and the 2007 Energy Independence and Security Act offered significant incentives to encourage clean energy and energy efficiency. One key subsection of these pieces of legislation included the renewable fuel standards requirements that will be discussed later in the Portland case study. Additionally, the 2009 American Recovery and Reinvestment Act (ARRA) included large amounts of funding and loan guarantees directed at encouraging growth in clean energy.

Even with the knowledge that we have not yet discovered a silver bullet for energy woes, efforts are still growing to find acceptable solutions. Investment into clean energy has grown exponentially over the past decade. "By 2008, clean energy technology enterprises were among the top recipients in the United States of venture capital dollars, with approximately $3,350,000,000 in funding" (Opp and Osgood, 2011, 14). With this surge in interest and efforts directed at the clean energy sector, the time is ripe for local administrators to capture some benefits from this growth. Of the clean energy sources highlighted in this chapter, three are likely to have the most potential for communities seeking economic development opportunity: wind, biomass, and solar. Unlike geothermal and hydropower, these three sources can be utilized and/or manufactured in almost all locations. Some of the more adaptable techniques are highlighted in the following sections.

Manufacturing

While general manufacturing in the United States has declined sharply over the past several decades, green technology manufacturing is an area with growth potential. All of the clean energy technologies profiled in this chapter require equipment that must be manufactured. Given the relative young age of many clean energy technologies coupled with the expense related to expanding these technologies, the government usually plays a central role in incentivizing these industries. Incentives are found across the state and federal governments. (See the resources section at the end of this book for a list of incentives related to green energy and technologies.)

Grayfields, Brownfields, and Clean Energy Manufacturing

Some of the lessons from Chapter 2 concerning grayfields and brownfields also can apply to encouraging clean energy manufacturing in a local area. Deindustrialization

and economic changes in a community have left many struggling to find uses for their old and empty buildings. One possible option for some of the larger buildings could be clean energy manufacturing industries.

In many communities that were once anchored by manufacturing, it is likely you will see physical evidence of the massive deindustrialization of America that has occurred. It is not uncommon to see old, abandoned buildings where previous industry once operated. These old industrial buildings are often great locations for new manufacturing focused on clean energy technology. It is not uncommon to have well-established infrastructure in the areas where these buildings exist. This infrastructure can be a positive asset when a city is marketing the location for a new clean energy manufacturing firm. Forward-thinking and inventive local administrators can take an inventory of their resources, the state and federal incentives available to them, and put together a marketing scheme to attract the types of industry the community desires. As clean energy continues to grow, cities can put themselves out there as a willing and ready participant in this growing industry.

In addition to simple assessment and marketing, a comprehensive effort to attract clean energy manufacturers will require human resources analysis. In other words, what types of skills do your residents have? Can you offer any training to help prepare your citizens for this type of employment? Can you partner with the local technical college or university to identify training opportunities? Additionally, the effort will require an assessment of the exact resources that are appropriate for this endeavor. How can you advertise the facility to prospective industry? Web sites, brochures, and professional networking can all play a role here.

Many areas of clean energy manufacturing are ripe for domestic expansion. For example, according to the American Wind Energy Association (AWEA) there are currently over 470 manufacturing facilities across the United States dedicated to building parts of wind turbines. Furthermore, another 100 projects related to wind energy manufacturing are currently under development (AWEA, 2012). Given the relative difficulty and expense associated with transporting the large wind turbines across the United States, it is likely an industry that will require continued geographic expansion of manufacturing facilities to minimize transportation costs.

Nationally, many examples exist of successes with transforming old abandoned (perhaps contaminated) buildings into new, clean energy, manufacturing facilities. One example profiled by the EPA is that of the old Maytag plant in Newton, Iowa. When this plant closed in 2006, it left over 1,800 people without jobs as well as a 1.9-million-square-foot facility empty (EPA, 2009). Ultimately, after contamination was remediated by the responsible party, a successful partnership between the city, county, and a private property manager began actively marketing the site for clean energy manufacturing firms. Then, in 2008, a firm that manufactures steel and concrete turbine towers for wind energy located into a portion of the empty building. This new facility has created new employment opportunities and has made use of what would otherwise be an old, empty and contaminated building in this community (EPA, 2009).

Incentives

One relatively controversial issue associated with attracting any industry (not just clean energy) to a community is that of incentives. The most commonly used incentives include grants, loans, tax abatements, and sales tax kickbacks (Koven and Lyons, 2010). The reality of incentives is that many of the most successful communities have used some sort of financial incentive as part of their efforts to attract clean energy development. In academic and scientific literature, the use of incentives is not necessarily a positive thing and should be embarked upon with great care. Unfortunately, there are no simple answers that can be presented here concerning the appropriateness of incentive use for a city. In the past, problems with how many jobs were actually created, length of time a business stays in a community, and who was hired for employment needs have all been unanticipated and unwelcome ill effects with the granting of (usually financial) incentives.

Some general advice that is useful when thinking about whether to use incentives can be presented for the interested local administrator. Specifically, when using any incentive package, it is highly advised that the public sector actively work to ensure that they receive tangible, and expected, benefits from doing so (Koven and Lyons, 2010). Contracts with clawback (previously given money or benefits that are taken back due to special circumstances) provisions for incentives, for example, can help protect the public sector interest in the development. Additionally, a phased incentive process where incentives are obtained over a period of time as milestones are met also could work to protect the public sector interests.

Conclusions and Concepts in Action: Portland, Oregon

Clean energy is expected to be one of the most important growth opportunities for the future. Local administrators can utilize lessons in this chapter to help prepare them for the inevitable changes that the energy market will have in the years ahead. Many cities will be able to engage this growing clean energy sector to help position themselves for the economic benefit. While the first part of this chapter offered very valuable information and suggestions for the interested local administrator, more can be learned by examining a specific case of these concepts in action. This chapter will close with 10 lessons that can be gleaned from a city's experience with clean energy and economic development. Portland, Oregon, is internationally known for being a leading sustainable city. Although Portland may be truly a "best" case for sustainable economic development, much can be learned from its experiences with clean energy.

A CASE STUDY OF CLEAN ENERGY AND ECONOMIC DEVELOPMENT

While many cities throughout the United States enjoy the economic development that results from local clean energy-related industries and programs, the experience of Portland, Oregon, perhaps best exemplifies the magnitude of fiscal benefits that are possible when a city fosters and invests in nonpetroleum sources of electricity and fuel. Located in the northwestern corner of Oregon, the city of Portland has a population of more than 583,700 and over 65,400 firms within its 133.43 square miles of city limits (U.S. Census Bureau, 2010). Although Portland may be famous for its roses, bridges, and penchant for bicycling, the city also represents the country's 25th largest regional economy and has expected annual workforce growth rates of 2.4%—about six times larger than the national average. In order to combat current unemployment as well as provide new jobs for an expanding future workforce, Portland is implementing a five-year economic plan based on a "sustainable economy" that is expected to produce 10,000 jobs between 2009 and 2014 by bringing in clean energy businesses to the area (Economic Development Strategy, 2009, 2–5).

Given that Portland was dubbed "America's Greenest City" by *Popular Science* magazine, the pursuit of local economic development through clean energy-related industries may seem to be an obvious choice for the city (Svoboda, 2008). After all, it is both well acquainted with environmentally focused businesses and is characterized by a citizen culture that strongly favors "green" practices. Nevertheless, there are no guarantees for fiscal success with alternative energy. Not only does any economic strategy inherently embody risk, but one founded on the clean energy industry will be particularly plagued with uncertainty because future U.S. federal government policies, infrastructure needs, evolving technology, and unstable banking and lending conditions can drastically impede the speed of clean energy's progress.

The purpose of this case study is to demonstrate that while familiarity with green projects and widespread constituent support of sustainability-minded policies may have helped to *expedite* Portland's successful implementation of renewable energy-related development, it is the *breadth* of the city's diversified tactics to promote clean energy for economic expansion that makes Portland such a compelling exemplar. Therefore, rather than focus on only one of Portland's many initiatives encouraging economic growth through attracting clean energy industries, this case study will extract lessons from several of the city's biofuels, hydroelectric power, and solar and wind energy enterprises to formulate 10 universal and key strategies that can be used to stimulate localized clean energy market development.

The Backdrop of Green: Conditions That Aided in Portland's Clean Energy Economic Development

Portland, Oregon, is poised to be the capital of the global green economy due to the existing (and growing) concentration of clean technology firms, experience in promoting "sustainable" habits, state and local public administrators supportive of green policies, and extensive access to international markets. Between operating the third largest marine port on the U.S. western coast and representing a main access point to the Columbia/Snake River system, Portland sees an $18 billion flow of goods come through its shipping ports each year. It also has one of 12 U.S. airports to offer direct air service to both Europe and Asia (Portland Development Commission, 2009, 3–5).

Despite its excellent location for global commerce, Portland's ability to attract a wide range of clean energy industries also can be partly attributed to the state of Oregon's business-friendly policies. In addition to having no sales tax in the state, Oregon also offers a Business Energy Tax Credit for investing in clean energy, energy efficiency, or energy conservation in order to help reach the state's mandate that 25% of Oregon's electricity must come from renewable sources by 2025 (Greater Portland, Inc., 2011; State of Oregon, 2012a). These energy tax credits cover up to 50% of the overall costs related to the equipment and materials, design, or installation of eligible projects initiated by business, nonprofit, tribal, or public entities (State of Oregon, 2012a).

The governor of Oregon also has developed a 10-year Energy Action Plan that recognizes energy as "THE issue of our time" and builds on three core schemes to improve the state's electrical and fuel futures: energy efficiency, the removal of financial and regulatory barriers for clean energy infrastructure, and a faster transition to a greener transportation system (Morris, 2012).

On top of its policies and administrative plans, Oregon also provides an ideal environment for Portland's clean energy-related economic development due to the hundreds of private, public, and not-for-profit organizations that help bolster green energy, clean technology, and sustainable living and corporate practices. Perhaps one of the most notable groups helping cities to achieve their clean energy goals is the Energy Trust of Oregon. This nonprofit organization partners with public entities as well as with four utilities throughout the state in order to promote clean energy and energy efficiency. From 2002 to 2010, the work of the Energy Trust of Oregon resulted in savings of nearly $800 million in energy costs. The Energy Trust of Oregon also offers cash incentives as well as informational resources to businesses and individual citizens purchasing or installing energy-saving equipment or projects (Energy Trust of Oregon, 2010).

Aside from Oregon's own initiatives to encourage clean energy, the city of Portland, itself, has a long history of green policies. Since in the early 1970s, Portland has continued to enact city-wide laws and community-based projects promoting recycling, greenhouse gas reduction, public and clean transportation, green buildings, and, of course, clean energy in both the public and private sectors. Even city operations have been targeted to cut back on excessive energy use, and through this City Energy Challenge Program, $9.46 million in public energy costs were saved between 1991 and 2001 (Englebert, 2012). The wide variety of the city's green programs as well as the extensive number of sustainability-oriented organizations within the area are all linked to Portland's ultimate goals outlined in the Climate Action Plan 2009, a strategy to reduce local carbon emissions by 80% by 2050 (Portland Development Commission, 2009, 5).

Clearly, the city of Portland has gained significant traction in its endeavor to build the local economy around clean energy industries due to state and city policies as well as a citizen base supportive of green initiatives. However, it must be reemphasized that Portland's success in expanding its economy through clean energy endeavors should be credited to the breadth of different market-minded approaches that encourage clean technology and renewable energy operations, not necessarily to the "culture of green" that assisted Portland in building a foundation for many of its current programs. Why is this the case? Cities around the nation desiring to attract clean energy industries to their region do not need to have a long-standing history of environmentalism to be successful. The rationale for producing and using alternative sources of electricity and fuel is no longer confined to ecologically based arguments; the move away from traditional energy sources is now recognized to be a wise fiscal investment because it creates domestic jobs and new economic sectors, combats rising energy costs, lowers dependence on foreign and expensive sources of petroleum, and encourages the development of cutting edge, domestic technology.

This case study will discuss 10 strategies that can be extracted from Portland's experience with clean energy and fiscal growth while explaining how these tactics can be useful considerations for any city-level public administrators who are interested in investing in clean energy-related industries for economic development, regardless of their city's past experience with alternative energy or green policies.

Establish City-Level Goals and Autonomous Policies

Strategy One: Demonstrate City-Level Initiative and Independence When Pursuing Clean Energy Industrial Development

Although the presence of state-level energy taxes and conducive business policies can be useful in establishing a first step toward economic growth, a city's best strategy to attract corporations related to clean technology and renewable power is to become its own unique haven for these clean energy industries. City governments should actively create their own reputations as newly emerging markets and business-friendly sites for green corporations rather than rely on (or be burdened by) the state's political, social, or environmental track records. Portland courted clean energy companies and set itself apart from other communities in 2007 by becoming the first city in America to adopt a local renewable fuel standard. The mandate required that all fuel sold in the Portland city limits contain at least a 5% blend of biodiesel in 2007 (rising to 10% by 2010) and a 10% blend of ethanol (City of Portland, 2012c, 2012d). The strength in Portland's renewable fuel standard was that the city was able to delineate itself as a location committed to renewable fuel, and welcoming of new and locally based biomass and biofuel production companies. In fact, Oregon also followed suit in passing its own state-level renewable fuel standard in 2007, but due to the federal Renewable Fuel Standard (first passed in 2005) and its volumetric requirements for using biofuels across the nation, 5 and 10% blends of biofuels were already present in the vast majority of available fuel supplies. Portland businesses, therefore, did not need to make any significant changes to their infrastructure or business practices in order to meet the new blend requirements passed in both the city and the state's legislation (State of Oregon, 2012b; Environmental Protection Agency (EPA), 2012).

By making easily attainable yet attractive policies, Portland distinguished itself as a city with a distinctive clean energy-focused market, but did so without requiring harmful or expensive changes to the existing businesses.

Strategy Two: Allow Local Success Strategies to Pave the Way for State/Regional Changes; Do Not Wait for Clean Energy Benefits to "Trickle Down" to the City Level

Clean Energy Works Oregon is a nonprofit program that works to achieve "triple bottom line benefits" (categorized as financial, social, and environmental advantages) associated with reducing energy waste and retrofitting buildings around the state with clean energy technology. Launched in 2011, this organization plays a particularly important role in introducing clean energy businesses and contractors to local communities interested in reducing

energy costs; it also offers easy, no-money-down financing and step-by-step guidance for installing and paying off new energy upgrades. Clean Energy Works Oregon aims to create or retain 1,300 jobs around the state, finish energy retrofits in 6,000 homes and 3.5-million-square-feet of commercial space, save more than 300,000 MBTUs of energy, and reduce lifetime carbon dioxide emissions by 200,000 metric tons within the first three years of its operations (Clean Energy Works Oregon, 2011).

While Clean Energy Works Oregon represents an important state-level entity that brings together public, private, and nonprofit groups to encourage the utilization of clean energy improvements, this organization is the result of a pilot program exclusive to the city of Portland called Clean Energy Works Portland (Clean Energy Works Oregon, 2011; Ansary, 2011). Regarded as one of the most innovative energy remodel programs in the country, Clean Energy Works Portland was originally founded as a collective effort by city administrators, utilities, and state and local organizations to expand the market for clean energy technology by providing capital and informational resources to home and business owners around the city. The program became so successful, especially due to the 500 "early adopters" participating in the clean energy retrofits, that the city was able to attract $20 million from the U.S. Department of Energy to enlarge the program to a state-wide organization (Ansary, 2011).

Overall, Portland's city government, businesses, and local organizations realized in 2009 that the local community was motivated to increase the use of clean energy and become more energy efficient. Instead of petitioning the state to create a program that could promote the expansion of clean energy industries and then waiting for the benefits to "trickle down" to the city, Portland relied on its own initiative to create Clean Energy Works Portland. The overwhelming success of this pilot program then captured sufficient funding to expand the program beyond the city, but, by acting independently, Portland garnered further recognition of being an ideal location for clean energy-related companies while also proving its willingness to foster market-driving programs.

Public Engagement

Strategy Three: Foster Demand for Clean Energy Industries and Products through Public Outreach and Education

Creating an attractive environment for clean energy-related firms requires more than business-friendly policies and local monetary incentives. Citizens' acceptance of an industry's presence in the community plays a critical role in the long-term appeal of an office location or manufacturing site. Public

engagement and education regarding the benefits of clean energy industries should be a priority for city administrators, especially as a public's understanding of the benefits of clean energy technology can simultaneously create a strong local market for the industries' products.

Although Portland offers some of the best financial incentives in the nation for homeowners installing solar energy, with funding covering up to 80% of installed costs, the city government's Bureau of Planning and Sustainability (BPS) realized that citizens and businesses alike needed to understand how solar energy could be a good investment in the cloudy, rainy climate of Portland, Oregon (City of Portland, 2012f, 2012g). In 2006, in collaboration with the U.S. Department of Energy, the Energy Trust of Oregon, and several state agencies, Portland's BPS began its first solar program to accelerate the demand for and implementation of renewable solar energy systems in the city through the provision of public education and technical assistance. The city continues to support ongoing market expansion of solar energy by holding several workshops each month in order to explain how solar power remains advantageous for an area famous for its rain while also describing how locally based solar industries are improving Portland's economic and environmental future (City of Portland, 2012f).

Strategy Four: Provide Current Information Regarding Clean Energy Businesses and Products to Make Clean Energy Accessible

Once educated about the benefits of clean energy products and technologies, citizens may still not engage in supporting local clean energy firms by using green alternatives to electricity and fuel if they do not know how to easily access these resources. City administrators should ensure that current and helpful information on clean energy products is conveniently and readily available to their constituents.

Portland has tackled the information accessibility problem by setting up useful, concise, and easy-to-find Web pages on the city's Bureau of Planning and Sustainability's (BPS) Web site. This strategy has been particularly useful for the area's biofuels industry. Although many people who drive "flex-fuel" vehicles are interested in using biofuels in higher concentrations than found in the normal fuel sold at most filling stations, it can often be difficult to locate the fuel distributors that offer these higher blends of biodiesel and ethanol. The BPS Web site, therefore, not only gives information on the benefits of biofuels, biofuel-related grant programs, and city operations involving biofuels, but a clearly marked Web page also gives up-to-date information and maps for biofuel retail locations in the Portland metro area as well as throughout Oregon and Washington (City of Portland, 2012h). Not only does accessible information regarding biofuel stations help attract biomass

and biofuel producers to the region, but the local biofuel retailers also greatly benefit from this arrangement.

Market Growth and Industrial Expansion

Strategy Five: Attract Clean Energy Industries That Are Related to Existing Local Industries to Form "Clean Energy Clusters"

Promoting economic growth by clean energy industrial development can be facilitated by attracting green industries or businesses that complement the region's existing industrial strengths. Because over one third of Portland's manufacturing workforce has experience or skills applicable to the wind energy industry, the city is actively pursuing a "wind cluster" strategy as recommended by the Portland Development Commission (Greater Portland, Inc., 2011; Portland Economic Development Strategy, 2010).

The cluster strategy is a logical method for bringing together trade sector industries by coordinating them "in a manner that makes more efficient use of resources and captures synergies in otherwise unrelated activities" while removing any barriers that would prevent profitable collaboration (Portland Development Commission, 2009, 7). In other words, cities can revitalize or expand local industries to "fit" with the needs of clean energy businesses by actively coordinating with these groups, such as bringing together Portland's metal manufacturing industry with corporations specializing in producing wind turbines.

Not only does the cluster strategy help to bring in new, clean energy business to the region, but utilizing the resulting clean energy products also can reduce overall costs and provide green, efficient electricity resources. The wind energy clusters in Portland, and elsewhere around the state of Oregon, are expected to bring in over $3.1 billion in new capital investment, $20 million in annual royalty payments to rural landowners, and $250 million in property tax and community services while providing 2,800 construction jobs and 155 permanent family-wage employment opportunities (Portland Economic Development Strategy, 2010).

Strategy Six: Use Clean Energy Partnerships to Expand Corporate Networks

In March 2012, The Portland Water Bureau partnered with Lucid Energy and the environment engineering firm CH2M Hill in order to install new clean energy technology that will provide enough hydroelectricity to power up to 300 of the city's homes next year. Using Lucid Energy's new "Lucidpipe" innovation, the city will install a number of new water and sewage pipelines equipped with a small turbine on the inside to generate electricity as

gravity-fed water flows through the system. The project has several obvious benefits including a new, sustainable, and profitable infrastructure option as well as a novel way to generate clean energy. The partnership also has allowed the city of Portland to establish indirect links to many international corporations that could lead to advantageous business collaborations in the future. Because Lucid Energy and CH2M Hill work with important leaders in clean energy, such as Siemens, Honeywell, Northwest Pipe Company, and Johnson Controls, the city of Portland can utilize its experience installing the innovative pipelines as an opportunity to broaden its network of potential, long-term business partners (Lucid Energy, 2012).

In short, cities pursuing fiscal development by creating clean energy economies should see every project and collaboration as an occasion to establish links with companies and their respective partners. Networking and creating ties with global leaders in clean energy technology can lead to important economic opportunities in the future.

Strategy Seven: Expand the Target Markets for Clean Energy Products and Technologies to Avoid Market Saturation

Any industry that manufactures products intended to last a long time faces the problem of market saturation— and clean energy-related industries can be severely affected by this drop-off in demand. Once the cities, businesses, or homeowners who are interested in using clean energy technology actually install their solar panels or wind turbines, they no longer need additional clean energy products for many years. Generating new demand or creating a new market from a different clientele base can be extremely challenging for corporations dedicated to specialized products.

To avoid the problem of market saturation for the solar energy industry in Portland, city administrators have developed a "community solar" program that allows citizens or businesses that do not own property or have a site conducive to solar projects to still participate in supporting solar electricity systems. The community solar initiative enables citizens to contribute money to help fund the upfront costs associated with the design, materials, and installation of solar panels for large-scale or public projects. Several public elementary schools in Portland's metro area have greatly benefited from the results of these community-based solar programs (City of Portland, 2012e).

In addition to preventing market saturation and the loss of jobs related to clean energy installation, collective clean energy initiatives can ensure citizen participation beyond a small "core" of supporters, increase local experience and connections with solar energy, optimize project site planning, and provide opportunities to test new models or financing schemes (Bonneville Environmental Foundation, 2011).

Strategy Eight: Prepare for a Strong, Long-Lasting Clean Energy Industry through Renewable Energy-Related Education and Certification Programs

In order for Portland's clean energy industry to continue to expand and strengthen in the future, the city must ensure that a well-educated workforce will be able to continue to advance clean energy technologies and markets within the region. Apprenticeships, training programs, and summer job opportunities working with solar, wind, and hydroelectric power systems are critical for the longevity of Portland's economic development through clean energy-related strategies because research studies indicate that the interconnected relationships between higher education, local government, and industry are increasingly important in determining a region's social and economic conditions and success (Portland Development Commission, 2009, 17; Mayer, 2006).

Currently in the greater Portland metro area, the Oregon Institute of Technology and Portland Community College have degree programs solely dedicated to clean energy industries. The Oregon Institute of Technology offers both a bachelor's and master's of science in renewable energy engineering, and the program is dedicated to preparing electrical and mechanical engineers to be specially trained to work with photovoltaic power systems, geothermal electricity, fuel-cell batteries, and wind as well as biomass-based energy (Oregon Institute of Technology, 2012). Portland Community College, on the other hand, has a curriculum in electronic engineering technology that prepares students to be involved in manufacturing, servicing, or installing renewable energy systems as trained technicians (Portland Community College, 2012).

While local colleges and universities may continue to develop new programs related to clean technology and renewable energy due to growing interests in these industries, Portland's city government needs to play a more active and supportive role in alternative energy-based education and workforce certification programs. The lack of widespread, direct involvement by public offices in the preparation of the city's future workforce is the main weakness of Portland's plan of clean energy-related economic development.

Accumulating and Employing Outside Resources

Strategy Nine: Utilize Federal and State Funding, Initiatives, and Informational Resources to Improve Local Clean Energy and Economic Development

While cities should certainly initiate local programs for economic development and the attraction of clean energy businesses, city-level public administrators

should not be timid in seeking out or employing federal and state financial and informational resources to maximize their results. Monetary support and detailed guides regarding the development of clean energy industries for fiscal growth can far extend the success and lifespan of a local program.

Portland is an excellent case study for renewable energy development as the city has been very effective in collecting monetary support from both local private and public groups as well as financial assistance from state and federal sources. Although the American Recovery and Reinvestment Act of 2009 (ARRA) awarded the city of Portland over $5,600,000 for energy efficiency projects, public administrators have acquired the majority of outside funding from competitive grants. Since 2009, Portland has been awarded ARRA money from the following programs:

- National Clean Diesel Funding Assistance Program: $1,622,348
- Solar Market Transformation: $400,000
- State Energy Program (SEP): $565,448
- Local Energy Assurance Planning (LEAP initiative): $276,099
- Energy Efficiency Community Block Grant: $13,000,000

The capability to repeatedly receive grant money from state and federal programs represents an important advantage for Portland in attracting and promoting clean energy corporations and technologies (City of Portland, 2012a). Not only does the city earn a valuable reputation as being able to successfully compete for financial assistance, but acquiring grants relating to a wide range of energy-related programs demonstrates that Portland has a diversified market for a variety of clean energy.

In addition to successfully navigating the realm of competitive grants, Portland also has been prudent in utilizing federal informational resources regarding the creation of clean energy markets. Beginning in 2007 and continuing through 2008, Portland participated in the U.S. Department of Energy's experimental Solar America Communities program, an initiative that fostered collaboration among 25 different cities to accelerate solar energy technology and reduce barriers to solar market development (U.S. Department of Energy, 2012a). This unique federal–local partnership program gave way to the SunShot Initiative in 2009. The SunShot Initiative is a program that now publishes an annual comprehensive guidebook that provides a framework for building solar markets while also discussing the logistical and policy options to creating an economically beneficial solar community (U.S. Department of Energy, 2012b). Overall, Portland's initial involvement with the Solar America Communities program allowed city administrators to gain insight into the experiences of other cities pursuing

renewable energy market development, and the resulting annual publication from the federal SunShot Initiative continues to provide administrators in Portland with new ideas and problem-solving techniques that can help realize a robust solar industry.

Ensuring a Holistic Direction

Strategy Ten: Connect Clean Energy-Related Industrial and Economic Goals to a City's Sense of Identity

To be successful in achieving clean energy-related economic development, administrators must ensure that this growth strategy is framed as complementary to a city's overall "character" or sense of identity. Fiscal policies, regardless of the amount of capital they can immediately bring to an area, will not survive if such development initiatives are seen by the public to be detrimental to a city's long-standing "personality." For example, a city population that collectively prides itself on having a friendly, small-town atmosphere will fight against plans for large-scale urbanization and industrialization. Likewise, a city like Portland, which is rooted in the ideals of sustainability and quality of life, must perceive that attracting clean energy industries will continue to nurture, not destroy, the city's overall objectives of prosperity, education, health, and equity as outlined in The Portland Plan.

The Portland Plan represents a "strategic roadmap" to help the city "thrive into the future" (City of Portland, 2012b). After two years of research during which workshops, fairs, community meetings, and 20,000 comments from Portland residents, corporations, and organizations helped shape the contents of The Portland Plan, this document was adopted by the City Council in April 2012 as a blueprint for the future. Three major goals of the plan include (1) a thriving educated youth, (2) economic prosperity and affordability, and (3) a healthy, connected city (City of Portland, 2012b). By examining several of the more detailed objectives within the document itself, it is clear that the expansion of economic development through renewable and alternative energy industries appropriately fits in the city's sense of identity, promising long-term viability for this economic strategy.

Reflections on Portland

Portland, Oregon, has successfully begun to achieve economic growth by implementing a number of different development strategies based on attracting clean energy industries to the area and working to expand local alternative energy markets. This case study outlines 10 strategies that can be extracted from the city of Portland's experience and implemented in other

regions around the United States. It demonstrates that a historical or cultural precedent for green technologies is not required to enjoy the economic benefits possible from clean energy-related industries as long as a diversified range of economic-boosting strategies is carefully employed.

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Chapter 4

Green Transportation: An Amenity Approach

As discussed in the previous chapters, transportation plays a prominent role in shaping how a city evolves and develops. In fact, transportation plays a role in almost all aspects of a community. Sustainable economic development efforts will likely have transportation concerns as a central part of any development efforts that seek common ground between sustainability and economic development.

Community efforts at smart growth are often linked to sustainable transportation initiatives. "Smart growth is the phrase most recognized in the struggle to balance development pressures with quality of life concerns held by residents in these areas" (Coffin, Williams, and Muething, 2002, 1). It has been argued that without sustainable transportation, smart growth will be impossible to achieve (Pollard, 2001). Sustainable transportation efforts can be as large as a comprehensive citywide planning effort embedded within an even larger smart growth planning paradigm, or they can be as small as a single project directed at easing congestion.

While many modes of transportation exist, the personal automobile is still the primary method of transport across the United States. From an environmental standpoint, the personal automobile is one of the largest contributors to air pollution in America. Compounding the damage to the environment, the current state of transportation in American cities also is resulting in consequences that are detrimental to local economies. Roadway construction, repair, and maintenance consume a significant percentage of a community's annual budget. In addition, some economists have pointed to a "tipping point" where travel by motor vehicle begins to have a negative economic impact on a city with respect to revenues (Litman and Burwell, 2006). Time spent commuting, consumers being deterred from

visiting parts of a city, and frustrations with traffic are all elements that translate into negative economic consequences for a city (Wheeler and Beatley, 2009, 115). Transportation considerations are an important part of pursuing and achieving sustainability and economic development in a city. To date, many cities have included changes to their transportation systems as part of their sustainability efforts.

Cities interested in pursuing greener transportation have an array of options available to them for consideration ranging from simple to extremely complex. The first part of this chapter highlights some of the most adaptable techniques for pursing green or sustainable transportation. The second part of this chapter offers an in-depth case study of Tucson, Arizona's, experience with green transportation.

Green/Sustainable Transportation

Traditional transportation planning emphasizes development that is newer and faster—likened to a linear or series model (Litman and Burwell, 2006) (Figure 4.1). Sustainable transportation planning, however, requires that transportation be viewed more as a parallel model. The parallel model essentially instructs planners to "… use each mode for what it does best" (Litman and Burwell, 2006, 335). So, rather than move in the direction of a continual emphasis on automobile transportation, a city and its transportation planners take a step back and emphasize a system-wide view of transportation. That is, participants engaged in the design process should view the usefulness and viability of all forms of transportation: walking, bicycling, trains, buses, light rail as well as the automobile. By embracing a more comprehensive view of transportation options, policymakers, administrators, and planners can begin to explore the ways that a more sustainable transportation system can be achieved in concert with development.

Sustainable transportation and its relationship with economic development can best be understood through the lens of the third wave of economic development strategies highlighted in the first chapter of this book. As a reminder, wave three strategies deal with the quality of life aspects of a city and their ability to generate economic development. "To recruit businesses to a community as well as retain firms already in residence, communities need to maintain a good quality of life and high environmental standards" (Koven and Lyons, 2010, 125). If a city suffers from

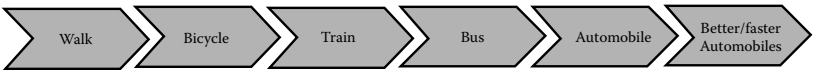

Figure 4.1 Linear transportation planning model. (Adapted from Litman, T., and D. Burwell. 2006. *International Journal of Global Environmental Issues* 6 (4): 331–347.)

poor air quality, traffic congestion, and increased expenditures on roadway maintenance, quality of life indicators will be negatively impacted, which can translate into negative economic consequences. City transportation systems can be designed with intentionality so that they generate benefits for the environment and local economy simultaneously. The following sections of this chapter will be dedicated to exploring some of the most adaptable, sustainable transportation opportunities that currently exist.

Existing Infrastructure Techniques

A good first place to start with any policy area is an examination of the current conditions in the community. Although roadway construction and expansion has certainly contributed to the problems of sprawl, air pollution, traffic fatalities, and congestion, there is nothing that says transportation infrastructure cannot be reworked to help minimize or eliminate these issues. General steps involved in analyzing current transportation conditions include (Daniels and Daniels, 2003):

1. Create an inventory and map of the various modes of transport in a community:
   a. Include density, type, location, capacity, and condition
   b. Include problems (i.e., physical conditions or traffic accidents)
   c. Include any proposed projects (either by the city or state)
2. Gather public opinion and concerns (needs assessment):
   a. Seek out resident ideas on improvements
   b. Seek out resident complaints on various aspects of the transportation infrastructure
3. Analyze the information:
   a. Forecast population growth and shifts
   b. Consider the viability and appropriateness of other or new transportation modes

After gathering the necessary information on the condition and future of the transportation system in a city, it may be easiest (and most cost effective) to begin with congestion problems. Congestion has been linked to increased CO_2 emissions and consumption of fuel, which are both detrimental to the environment with the latter especially so given its status as a nonrenewable energy source (Barth and Boriboonsomsin, 2009, 1). Beyond the environmental impact resulting from congestion, economic implications also are present as potential consumers are dissuaded from traveling into parts of the community where traffic is heavy. There are many strategies that a community can engage in to help minimize congestion. Many of these can be pursued without needing to completely redevelop existing infrastructure.

Public Bus

Mass transit technologies are often the most obvious solution to congestion and air quality problems in a community. Municipal bus systems can be an easy first place to look for potential relief from these issues. Unfortunately, many residents find bus transportation to be undesirable due to added time to destination (i.e., sluggish vehicles), inflexible routes, and a perception of unreliability. In some cases, the best solution to these issues is with route expansion. However, route expansion can be very expensive or unrealistic in some communities. Fortunately, there are a number of other methods that a community can employ to help relieve congestion through the bus transit system. The following sections will highlight some of the improvements that can be made to encourage bus ridership within a city.

Technology Improvements

Given that the average municipal bus only travels at 60% of the speed of a personal automobile, reducing the time spent on buses will go a long way toward encouraging expanded ridership (Federal Transit Administration, n.d.). Relatively simple technology improvements can help reduce the time spent on a public bus. For example, in Portland, Oregon, city buses receive signal priority at traffic lights using sensors connected to the traffic signal. These sensors trigger a green light or a shorter red cycle. This signal priority allows a bus to travel more efficiently and reliably (Schack and Mason, 2010). As buses travel more efficiently, commute time is reduced. With a shorter commute time, more residents may be encouraged to utilize the bus system and congestion may be eased.

Technology also can help with the time required to load and unload onto buses. At busy bus stops, a complaint many riders have is the amount of time required to board a city bus. One easy way to lessen this time drain is to allow for prepayment of fares so that passengers can board the bus from all doors. Increasing the amount of available embarkation and debarkation points, as well as time saved from not waiting for passengers to pay the driver, can be a significant positive change for riders. These time savings can ultimately help encourage additional ridership and possibly result in less congestion in the city. The city of Los Angeles has successfully begun the process of allowing for prepayment of bus fares on some lines. More specifically, the city created a procedure where passengers can purchase tickets at the bus stop rather than on the bus (Schack and Mason, 2010). Now when the bus approaches, riders are able to enter the bus much faster than before this procedure was implemented.

Lower Cost Infrastructure Improvements

There are a few things that a city can do to improve infrastructure to encourage faster travel by city bus. These items include:

- Reserved lane: Having a lane specifically dedicated to buses in a city can help buses travel faster and avoid the commute congestion.
- Changes in bus stop locations: A common delay that buses face when reentering traffic from picking up or dropping off passengers is the wait time related to right-turning vehicles. Analyzing the location of bus stops can provide some insights into whether other traffic patterns are contributing to the slowness of a city bus. Right turns can be prohibited in some intersections or bus stops can be relocated away from intersections to avoid delays (Federal Transit Administration, n.d.).

Partnerships

In addition to technology and infrastructure improvements, effective partnerships also can help to encourage additional bus riders that may have not considered bus travel. One way to identify potential partners is to conduct an analysis of the largest employers in the community. For example, a college or university, generally among many communities' top employers, may be one of the leading contributors to traffic congestion. By partnering with them, a community can seek to create a partnership that facilitates and encourages access to the bus for faculty and students, while also generating additional revenue for the transit authority or transportation agency. One such example is the University of Colorado at Boulder, which has enjoyed a successful partnership with the public bus system since 1991. This partnership provides the bus system with funding from student fees in exchange for open student access to all of the local buses. The City of Boulder has experienced a decrease in university-related congestion by having this partnership in place for the tens of thousands of CU Boulder students. Similarly, many college campuses have started exploring a no-car campus concept, where cars are generally restricted from or limited on the interior parts of campus. As more campuses turn *green* and seek to change the transportation habits of its faculty and staff, cities can reap the benefits of increased ridership on its bus routes at the same time as decreasing the number of faculty, staff, and students who would have previously used the roadways with their own automobiles.

Light Rail

While it is true that, for smaller-to-medium communities, light rail may not be an economically viable option, it is still an option for communities with the resources and ridership to warrant its consideration. Its contemplation, however, should be done within the context of several recent economic studies offering warnings on whether the rhetoric of its economic development benefits match reality. In fact, in a 2004 analysis of light rail transit in America, a senior economist at the Federal Reserve Bank of St. Louis presented data suggesting light rail transit requires substantial and continual public subsidy (Garrett, 2004). The burden of a hefty subsidy

may be too much for many cities to shoulder. However, even with the need for subsidies, many cities and metropolitan areas have enjoyed successes with using light rail to relieve congestion and to improve the economic condition of areas of their city. A key environmental benefit of light rail transportation is the opportunity to use renewable energy sources to power light rail. Rather than rely upon nonrenewable petroleum (as automobiles do), light rail transit uses electricity that, in some areas, can be based in renewable energy sources (i.e., solar, wind, hydropower, etc.). By some estimates, more than 40 U.S. cities are currently examining the possibility of adding light rail lines in addition to the 50 cities that already have operating light rail systems (Daniels and Daniels, 2003). (See Table 4.1 for a partial listing of cities with light rail systems.)

In some cities, light rail is better used for economic activity than for congestion relief. For example, in Phoenix, Arizona, the city's light rail is used primarily for recreation and not commuting. As a result, the system has been credited with the revitalization of Phoenix's downtown. Revenues in the area have been consistently, and substantially, up from the revenue collected before the presence of the light rail. Furthermore, the public image of the downtown has improved substantially in part due to this public investment. The most commonly identified reasons for the success of this project are ease of travel using the light rail, connections to the local college campus, and an affordable fare structure (Steinhauer, 2009). As discussed earlier, light rail is not an inexpensive transportation investment. However, careful planning and consideration may indicate that local benefits can accrue from such an investment. Some communities also have had successes in promoting tourism through the reintroduction of historic trolley cars in their cities. Overall, light rail's impact on congestion relief may be secondary to the increased economic activity from having a light rail transportation system in place.

Walking and Biking

By most accounts Americans do not like to walk (Vanderbilt, 2012). In some cases, it may be completely unrealistic to assume that a large percentage of a city's residents could effectively walk to work. Being a parent of small children, inclement weather, and poorly developed infrastructure can all prevent an individual from being able to walk or ride a bicycle as their primary, or even secondary, mode of transportation. Bicycling may be slightly more popular than walking (bicycling makes up about 1% of all trips in the United States), but is still not a top-ranked choice for personal transportation in the United States (Pucher, Komanoff, and Shimek, 1999). Nonetheless, there are many things that a community can do to encourage its citizens to either walk or bike to their needed destinations.

The three biggest impediments to bicycle and pedestrian travel in cities are distance/sprawl, safety, and convenience (Shuford, Rynne, and Mueller, 2010). The most obvious of these impediments is the safety issues that arise out of a lack of sidewalks and/or designated bike lanes. A number of cities have attempted to

Table 4.1 Operating Light Rail/Trolley/Streetcar Transportation Systems

Location	*Type*	*Year Began*
Baltimore, Maryland	Light Rail	1992
Boston, Massachusetts	Light Rail	1888
Buffalo, New York	Light Rail	1984
Camden, New Jersey	Light Rail	2004
Charlotte, North Carolina	Light Rail	2007
Cleveland, Ohio	Light Rail	1920
Dallas, Texas	Light Rail	1996
Denver, Colorado	Light Rail	1994
Fort Collins, Colorado	Vintage Trolley	1984
Fort Smith, Arkansas	Vintage Trolley	1991
Galveston, Texas	Vintage Trolley	1988
Houston, Texas	Light Rail	2004
Jersey City, New Jersey	Light Rail	2001
Kenosha, Wisconsin	Vintage Trolley	2000
Little Rock, Arkansas	Vintage Trolley	2001
Los Angeles, California	Light Rail	1990
Lowell, Massachusetts	Vintage Trolley	2003
Memphis, Tennessee	Vintage Trolley	1993
Minneapolis, Minnesota	Light Rail	2004
New Orleans, Louisiana	Vintage Trolley	1835
New York (JFK Airport), New York	Light Rail	2003
Newark, New Jersey	Light Rail	1935
Oceanside, California	Light Rail	2008
Philadelphia, Pennsylvania	Light Rail	1858
Phoenix, Arizona	Light Rail	2008

(continued)

Table 4.1 Operating Light Rail/Trolley/Streetcar Transportation Systems (continued)

Location	*Type*	*Year Began*
Pittsburgh, Pennsylvania	Light Rail	1859
Portland, Oregon	Light Rail	1986
Sacramento, California	Light Rail	1987
Salt Lake City, Utah	Light Rail	1999
San Diego, California	Light Rail	1981
San Francisco, California	Light Rail	1960
San Jose, California	Light Rail	1987
San Pedro, California	Vintage Trolley	2003
Seattle, Washington	Vintage Trolley	1982
St. Louis, Missouri	Light Rail	1993
Tacoma, Washington	Street Car	2003
Tampa, Florida	Vintage Trolley	2002
Tucson, Arizona	Vintage Trolley	1993
Yakima, Washington	Vintage Trolley	1974

address the safety of its bicyclists and pedestrians by creating dedicated bike lanes or sidewalks. Distance also poses a problem to those wishing to walk or bicycle to their destinations given the distance typically found between housing developments and the locations of places of employment in most developed cities. This is especially true of bedroom and suburban communities located along major highways or interstates designed to serve a larger city. Although many might like to be healthier and fit, traveling several miles to work each day by bicycle or by foot is not going to appeal to a majority of people.

Cities desiring to maximize the number of people utilizing bicycles or walking to work and recreation must seek out designs and innovations that lessen the burden or inconvenience of utilizing these modes of transportation. With respect to anticipatory development (see Chapter 2 for more information), the city can require that sidewalks and/or trails be installed. New development can be designed as well to be more compact in size, to further encourage walking and bicycling. Revitalization can focus on adding bicycle lanes and sidewalks where they currently do not exist.

One other issue related to the lack of walking or bicycling includes the public image of the activity (Pucher, Komanoff, and Shimek, 1999). Unlike some European countries, bicycling is not necessarily considered a normal activity in daily life in the United States. Instead it is simply viewed as a side recreational activity. "Where cycling is viewed as normal, people consider doing it. …" (Pucher, Komanoff, and Shimek, 1999, 132). Public policies can be implemented to help residents with their perceptions of cycling or walking.

Biking in Fort Collins, Colorado

Fort Collins, Colorado, has been particularly proactive in encouraging bicycling in the city (http://www.fcgov.com/bicycling/). In pursuit of creating a bike friendly community, Fort Collins has constructed and maintained miles of bike paths and bike lanes that virtually span the entire city. In fact, most streets have designated bike lanes. In addition to the dedicated infrastructure, Fort Collins has implemented several programs aimed at furthering the use of bicycles. Specifically, the city sponsors a bike to work week in the winter, a bike to work Wednesdays during the summer months, and a bicycle library where citizens can easily borrow bicycles. It is not uncommon to see homes advertised for sale with one of the biggest amenities being the proximity to the bike trails. In addition to the transportation benefits of these amenities, the quality of life is deemed superior in the city by most residents. In fact, the city has been voted in the top 100 places (peaked at number 6 in 2010) to live for the past several years by *Money Magazine*.

As mentioned earlier, the connection between quality of life amenities, such as the availability of multiple modes of transportation, including environmentally friendly options and economic development, can best be understood through the lens of wave three economic development strategies. Using this lens, cities seek to incorporate amenities that citizens find to be associated with an increased quality of life within their communities as a means of attracting business and residents. And, in many communities, the availability of extensive bike paths and sidewalks has increasingly been listed as a top amenity (Racca and Dhanju, 2006). Thus, localities seeking to find common ground between the environment and economic development can leverage modes of transportation that are more sustainable than the private automobile as part of a larger economic development effort.

Efficient Vehicles

In addition to the infrastructure changes, improvements, and additions that can help to alleviate the negative externalities associated with the hegemonic status of the personal automobile, communities can seek to implement policies designed that make its use more sustainable. Although mass transit, biking, or walking may be preferred from the economic or environmental standpoint, a comprehensive view

of transportation requires cities to also think about how they can make the use of the personal automobile less impactful on the environment. In this way, the policy goal shifts from changing personal preferences for the automobile to making its use sustainable. This may be, in the end, the more practical goal as changing preferences is a difficult endeavor, even when the evidence suggests doing so is the most rational option.

Electric vehicles have been steadily increasing in market saturation in recent years. As the market supply grows, it is expected that these electric vehicles will become more important to the overall transportation condition of the United States. Cities encouraging the ownership of electric vehicles are in a position to reap environmental rewards through lower emissions. Although encouraging the use of electric vehicles by city residents does not necessarily provide economic benefits directly to the city, cities may be able to see a savings in public costs by utilizing these vehicles in their operation needs. Additionally, cities that purchase and use these vehicles in their day-to-day operations may serve as a role model or leader for the citizens of the community.

Earlier this year, the Electric Drive Transportation Association (EDTA) highlighted four cities that had superior engagement in using and promoting electric vehicles: Normal, Illinois; Austin, Texas; Mercer Island, Washington; and Los Angeles, California. At least one of those cities, Normal, Illinois, has been able to capitalize on electric vehicles to grow its local economy and improve its quality of life for the residents. Specifically, the leaders of Normal "… ask[ed] Mitsubishi to make it among the early destinations for its new all-electric car, the i-MiEV" (Lydersen, 2011). The community has built at least four charging stations in recent months to make it even easier for residents to own these vehicles. Community leaders report that the improved reputation as a progressive community has increased their ability to "… attract and retain top-quality employees and businesses. …" (EVTown, 2011).

Conclusions and the Concepts in Action: Tucson, Arizona

Unlike many of the other chapters in this book, transportation is not a topic that lends itself well to a one-size-fits-all description and prognosis. Furthermore, transportation is inexorably linked to many other topics in this book. While the first sections of this chapter offer some broad suggestions for the interested local administrator, the following concluding section offers a real-world case study that highlights the difficulties and rewards associated with green transportation initiatives.

GREEN TRANSPORTATION AND ECONOMIC DEVELOPMENT

Greening transportation represents a difficult but often necessary challenge for local governments. In the United States, the transportation sector accounts for 29% of greenhouse gas emissions (Federal Transit Administration, 2011). At the same time, a robust transportation infrastructure is widely seen as necessary to economic development (Federal Highway Administration, 2011). This case study explores the relationship between modes of transportation, economic development, and the principles of sustainability by examining the efforts of Tucson, Arizona, with respect to their streetcar system.

Streetcars are not a new feature in urban landscapes. In fact, they once crisscrossed many American cities. However, as development shifted toward the suburbs and away from urban centers, streetcar lines were often abandoned or removed. Yet, in communities across America, streetcars are once again being thought of as a way to promote both economic development and sustainability. In Tucson, area leaders broke ground at the end of 2011 on a modern streetcar project that connects multiple neighborhoods and heavily trafficked areas to one another.

Background

The region has experienced fairly rapid growth over the past 50 years (Downtown Tucson, 2011a). In 2011, Tucson ranked as the 32nd largest U.S. city and planners expect the region to continue its upward growth trajectory in the coming years (Table 4.2). The city's land area also has grown. In fact, its "geographic size" has increased by more than 30 square miles since 1996 (Figure 4.2: Land size graph; Figure 4.3: Population density graph). Urban planners also are predicting these upward trends for downtown Tucson. By 2030, for example, they are expecting a downtown population of nearly 70,000, a 21% increase and a downtown workforce of over 80,000, a 35% increase (City of Tucson, 2011a). Finally, the city's employment base exceeds 60,000, helps to attract over 3 million visitors annually, and is home to 35,000 University of Arizona students (City of Tucson, 2011c).*

Downtown Tucson is the region's cultural and historic center. Recognizing its economic and cultural importance to the region, city leaders and voters have undertaken a number of initiatives aimed at downtown revitalization. Additionally, they have authorized an assortment of land-use changes, incentives, and regulatory reforms intended to encourage urban infill,

* Key downtown offices include the City of Tucson and Pima County administrative centers, Tucson Museum of Art, Tucson Convention Center, the Pima County Public Library, Ronstadt Transit Center, Federal Courthouse, Greyhound Bus Depot and the Historic Depot.

Table 4.2 Tucson Population Trends 1970–2020

Year	*Tucson*	*% Growth*	*Pima County*	*% Growth*
1970	262,933	n/a	351,666	n/a
1980	330,537	26	531,433	51
1990	405,390	23	666,880	25
2000	486,699	20	843,746	27
2010	546,569	12	1,025,000	21
2020	640,092	17	1,258,529	23

Source: Pima Association of Governments, 2011. Population estimates.

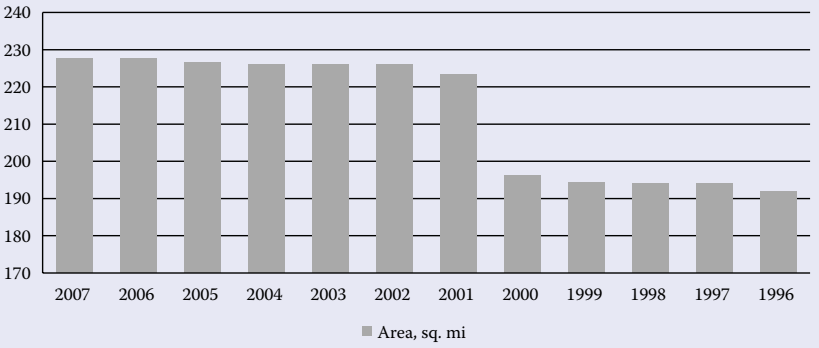

Figure 4.2 Tucson land area. (From City of Tucson. 2007a. Annual Summary of Growth.)

transit-oriented development, and other forms of sustainable development. The following list summarizes several of the major policy actions since 1999:

- In 1999, voters authorized the creation of the Rio Nuevo tax increment finance (TIF) district. The district may collect and receive sales tax funds from merchants and businesses within the district. Formalized in 2001, the Rio Nuevo Master Plan calls for a mix of housing, commercial space, attractions, and entertainment venues (Downtown Tucson, 2011b). The plan extends through 2025 and has already funded numerous public investments ranging from land acquisition to renovations of historic properties (Downtown Tucson, 2009). It should, however, be noted that the district, according to some, has not been a true success.

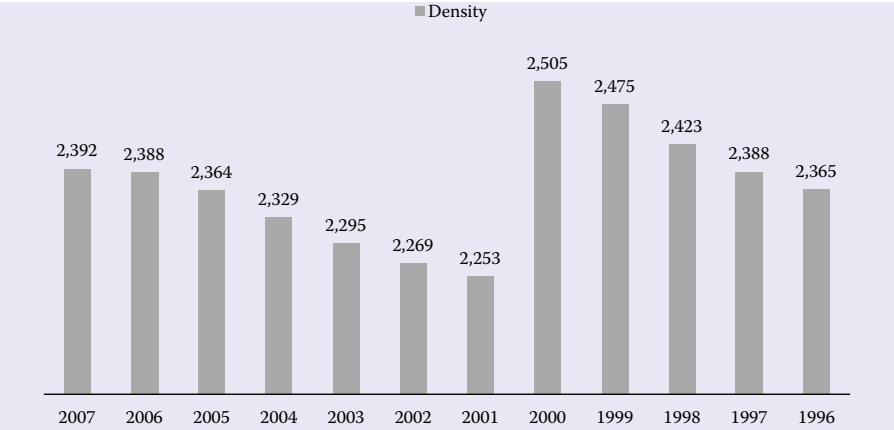

Figure 4.3 Tucson population density (persons/square mile). (From City of Tucson. 2007a. Annual Summary of Growth.)

Some participants believe that this project created a negative attitude about the city's downtown and within the larger community. To those that believe this, one of the biggest challenges for the streetcar system is to overcome that stigma.

- In 2004, the Tucson Department of Transportation initiated a federally supported study of transportation options for central Tucson. Part of its analysis included a study as to what forms of public transit would be appropriate for downtown. After more than a year of study and consultation with stakeholders, the review concluded that a modern streetcar system was the preferred alternative (Glock, 2010).
- In 2006, the city created a Downtown Infill Incentive District along major arterial roads leading into the downtown corridor and areas near the University of Arizona. The district encouraged both infill and transit-oriented development by enabling businesses and developers to build more flexibly than they could in more suburban areas. For example, within the district, the city waived its $10,000 building permit fee, offered a 2% construction sales tax credit for public right-of-way improvements, promised up to a 100% reduction in the city's parking requirements, and reduced its loading, setback-and-landscaping standards, and other impact fees (Tucson Regional Economic Opportunities, n.d.).
- Recognizing a need to protect its historic properties, in 2008, city leaders promulgated a new policy designed to protect historic neighborhoods. The ordinance created a set of design standards that required

new development to reflect the historic character and identity of the neighborhood (City of Tucson, 2010).

- The city also has offered businesses a downtown façade improvement program. Under this program, property owners may seek municipal assistance in financing façade renovations (Downtown Tucson, 2009).
- The city has passed a policy requiring that all new municipal buildings meet energy efficiency standards.
- The University of Arizona, in its 2009 comprehensive plan, set a goal of growing its student population while not expanding its land area. It intends to reach the goal mainly by improving building density and energy efficiency on campus. The university is seeking as well partnerships to facilitate the creation of new downtown Tucson housing options for nontraditional and graduate students (University of Arizona, 2009).

Regional Transportation Plan

The modern streetcar project was first proposed in the Regional Transportation Authority's (RTA) 2006 multimodal transportation plan. The RTA is a regional body composed of officials representing municipal governments (Cities of Tucson and South Tucson and the Towns of Oro Valley, Sahuarita, and Marana), Pima County government, tribal governments (Pascua Yaqui Tribe and the Tohono O'odham Nation), and state government through the Arizona State Transportation Board. Representatives from these entities form a nine-member governing board in which no member possesses veto power. This structural design has helped to facilitate collaboration among members (Regional Transportation Authority, 2011a). Shortly after its creation, the RTA presented its $2.1 billion transportation plan to Pima County voters scheduled to be completed in four 5-year increments (Table 4.3).

The plan addressed four specific policy objectives. Firstly, the plan proposed 35 projects designed to improve the region's roads and streets. Secondly, the plan called for improving transportation safety with a specific focus on intersections, bus lines, railroad crossings, and bridges. The plan, for example, called for the construction/reconfiguration of more than 200 intersections and bus pullouts. Thirdly, it focused on improving public transportation, which included the creation of the streetcar line and the expansion of bus service to neighborhoods not previously served, the establishment of a new neighborhood circulator service and the adoption of a park-and-ride express bus service. The final component of the plan emphasized environmental sustainability through the construction of greenways, trails and paths, wildlife linkages on roadways, new bikeways, and sidewalks. Additionally, the plan supported the creation of the Main

Table 4.3 Project Status

Projects at a Glance: Period Reviewed July 1, 2006—Jan. 31, 2011		
RTA Summary	*Number of Projects*	
Projects under Development	97	
Projects under Construction/ Implementation	54	
Transit Projects Implemented	22	
Total Number of Projects Completed	286	
Funds Committed	$505,168,000	
Green Transportation		
Alternative Transportation	*Projects Completed*	*Projects in Process*
Total Greenways, Bikeways, Pathways, & Public Transit Projects Sidewalks	43	17
	Projects Completed	*Projects in Process*
Weekday Evening	21	0
Weekend Service	23	0
Bus Frequency and Overcrowding Relief	7	1
Special Needs	3	0
Neighborhood Circulator	11	0
High Capacity Streetcar	0	1
Express Service	7	0

Source: RTA. 2011b. Our mobility.

Street Business Assistance Program, a program designed to support businesses within a quarter mile of a RTA project construction zone (Regional Transportation Authority, 2011b).

On May 16, 2006, Pima County voters approved the $2.1 billion plan (Regional Transportation Authority, 2011c). Voters also passed a 20-year,

half-cent sales tax to fund the plan, which is scheduled to sunset in 2026.* The plan passed by a 60% vote, and its funding component passed with 58% of the vote.†

Tucson's Modern Streetcar Project

Included in the RTA's initial projects is the new streetcar system. As of 2012, it is tentatively scheduled to operate daily from 6 a.m. to 2 a.m., with vehicles scheduled to stop every 10 minutes during the daytime and at 20-minute intervals during the evening. Each streetcar is capable of transporting up to 130 people. By 2020, the city predicts ridership will average 4,217 per weekday (City of Tucson, 2007b).

The costs associated with the modern streetcar project represent a small portion of the multibillion dollar RTA budget (see Table 4.4 for complete breakdown of estimated costs). The project is financed by both federal and local funding sources. In addition to the millions of locally generated sales tax dollars, the project has been able to leverage over $63 million in federal resources through the 2009 American Recovery and Reinvestment Act (ARRA). Yet, project funding remains an ongoing challenge, especially as sales tax collections have slowed (Pima County, 2011). In May 2011, for example, project leaders acknowledged that the project was short an estimated $19 million. Recognizing funding difficulties, project managers proposed two ways to decrease costs. First, they sought proposals to construct the entire 3.9-mile streetcar line at once rather than in four separate segments. By combining construction of the line segments into one project with one primary contractor, the city anticipates saving at least $6 million.‡ The city also is altering the type of rails requested from block rail to t-rail, which is also expected to save approximately $6 million.§

However, the economic slowdown, according to Carlos de Leon, the RTA Transit Services director (2011), has led to a positive development for the project. He remarked that "the recession has resulted in reduced construction costs and a high level of competition by construction contractors. The streetcar project is starting to see these reduced costs as it is bidding out the various construction packages. This should help the project stay within its

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* The tax was levied on everything except groceries, prescriptions, and rent.

† Four previous attempts at passing a regional transportation plan had failed.

‡ The city expects savings through more efficient and better use of manpower and equipment and a reduction in overhead costs.

§ The $12 million is comprised of $3.5 million in rail-type changes, $6 million in bidding procedure changes, and $3 million in savings on the Cushing Street Bridge changes (O'Dell, 2011).

Table 4.4 Estimated Modern Streetcar Costs

Streetcar Expenditures
$27 million rails and guideways
$4 million for streetcar stops
$15 million for support yards, shops, and administration buildings
$40 million for demolitions, utilities, environmental mitigation, and archaeology
$15 million for train signals, traffic signals, and power supply and distribution
$37 million for eight streetcar vehicles (seven operational and one reserve)
$36 million for engineering, design, project management, legal, permits, testing, and inspection
$14 million contingency
$8 million for finance charges

Source: O'Dell, R. 2011. $9.5M in savings found on streetcar project. *Arizona Daily Star*, March 4.

project estimate of $196 million" (City of Tucson, 2011a) (see Table 4.5 for complete breakdown of estimated project costs). It should be noted that the use of federal dollars did engender some challenges for managers as a result of the rules and regulations that always accompany grant money. For example, streetcars must be American made, which obviously limits where and from whom streetcars may be purchased.*

The streetcar system will feature a 3.9-mile route, with 18 stops that connect several major activity centers: the University of Arizona, Arizona Health Sciences Center, University Main Gate Business District, 4th Avenue Business District, Congress Street Shopping and Entertainment District, and the Mercado District. Project advocates cite this connectivity as the impetus for

* Oregon Iron Works to produce streetcars; rail lines also purchased in America, likely in Wisconsin

Table 4.5 Total Project Costs

Source	*Amount (in millions)*	*Purpose*
Local: RTA	$88	Capital and operations costs
Local: Utilities	$11	Utility relocation
Local: Gadsen Development	$3.2	Mercado District improvements
Local: City of Tucson	$4.6	Capital and operations costs
Federal: Transportation Investment Generating Economic Recovery—Matching Grant (TIGER)	$63	Capital, construction, and operational costs; needed to likely ensure adoption
Federal: New Starts Appropriations	$6 (of $25 received to date)	Planning and design
Federal	$14.98	Cushing Street Bridge project

Source: O'Dell, R. 2011. $9.5M in savings found on streetcar project. *Arizona Daily Star*, March 4. With permission.

economic growth and the cause for the subsequent reduction of environmental externalities (City of Tucson, 2010).*

Economic Development and Connectivity Benefits

According to project supporters, the new streetcar system will help facilitate the university and downtown corridors' expected increases in population (City of Tucson, 2010).† It is expected that the streetcar line will help to further integrate the university into the downtown. The university's Health Sciences Center (HSC) exemplifies how the new transit system will serve the university

* The city often cites the streetcar system in Portland, Oregon. In Portland, for example, between 1997 and 2008, the city reports 10,212 new housing units and 5.4-million-square-feet of office, institutional, retail, and hotel space. Importantly, construction took place within two blocks of the streetcar system (City of Tucson, 2011b).

† The UA anticipates accommodating a projected growth in its campus population from 50,000 to 75,000 by increasing building density on campus and downtown student housing.

and regional communities. Currently, the HSC is located in the northeast area of campus and employs over 5,000 people. The university anticipates that the number of individuals working or visiting the center will likely double within the next decade. Much like the remaining sections of campus, this growth will occur without the requisite number of parking spots or increase in land areas. These individuals will need housing and entertainment options. And, because the HSC, along with UA, is landlocked, a streetcar system will offer a way to increase enrollment through increased building density rather than the construction of new buildings (City of Tucson, 2010). It should be noted that a variety of maps can be found at the Street Car systems Web site (especially under the construction heading), which is available at: http://tucsonstreetcar.com/.

The increases in downtown student population will likely trigger additional retail, office, and residential development on locations adjacent to the route. In fact, private investors have already invested more than $120 million in the downtown area since 2009. For example, former University President Robert N. Shelton announced in the spring of 2011 that the university will begin offering courses in the Roy Place Building (a former Walgreens). The university is also working on two public–private partnerships that will house around 1,000 students in three facilities along the proposed streetcar line. Each is designed to be a mixed-use facility that offers commercial and retail space on the bottom floors with residential units above (Pallack, 2011).

Demand is already rising for space in the downtown area of Tucson. Table 4.6 has a complete list of recent and upcoming projects in this area. New demand for downtown locations also will likely increase property values especially near the line and stops by between 2% and 30% (City of Tucson, 2011b). Even a modest 4% average increase, for example, would amount to a nearly $9,200 increase in valuation per property by 2015. Also by 2015, if applied to the streetcar corridor of about 3,800 properties, the city's property tax base would increase by approximately $35 million (City of Tucson, 2011b).*

A final economic benefit anticipated by project proponents is job creation. The city expects job growth in three areas: temporary project design and construction, long-term/permanent jobs, and indirect or multiplier jobs **(**City of Tucson, 2011b**).**

- The City of Tucson projects that the system will create nearly 3,000 new design and construction jobs. Of those, approximately 1,200 will be related directly to project construction while another 1,600 will

* Streetcar corridor assumes all properties within 1,500 feet of the streetcar line.

Table 4.6 Redevelopment Projects in Advanced Planning Stages: June 2011

Sector	*Development*
Residential	341 new housing units (143 of which are senior low-income housing, market rate, and workforce housing)
Institutional	Planned future site of the university's Discovery Science Center and the State Museum
Institutional	Arizona Health Sciences Center planned expansions expected to add 1,000 healthcare jobs by 2020
Commercial (Mixed Use)	375-car garage, student housing above and 12,000 square feet of retail at ground level
Commercial	15 acres of developable land to add to current unique retail and entertainment businesses geared toward tourists, downtown workers, and residents and students
Institutional	In May 2011, the Sonoran Institute, an environmental advocacy organization announced plans to locate its offices downtown

Source: City of Tucson. 2010. Final supplemental. With permission.

occur across 19 separate industries needed to support the project (City of Tucson, 2011b). Approximately 1,000 jobs will be in industries that often employ low-income workers, which is equivalent to nearly $43 million in new sources of labor income.

- **By 2020, the city is forecasting the creation of over 4,000 permanent jobs within the streetcar corridor:** hospitality, 200 jobs; retail, 720 jobs; service, 2,880 jobs; and healthcare, 1,000 jobs (City of Tucson 2010). It should be acknowledged that the streetcar line is not directly responsible for many of these jobs, but because of the increases in downtown population, these jobs will be created as new residents demand amenities and other services.
- Although specific numbers are unavailable at this time, the Tucson streetcars will be manufactured in the United States, which also will generate new jobs (City of Tucson, 2011b).

Greening Transportation and Environmental Sustainability Benefits

The streetcar system adds to the city's existing public transit portfolio that includes the existing Sun Tran Bus and the university's Cat Tran systems. As

such, city leaders are optimistic that it can help slow down suburban sprawl, reduce the number of vehicle miles traveled (VMT), and mitigate downtown congestion. In this sense, they expect that it will produce a number of environmental benefits including improved air quality, decreased greenhouse gas emissions, and reduced demand for petroleum (City of Tucson, 2011b). In the system's first year of operation, 2013, for example, the city estimates a 900,000-mile reduction in VMT, which will conserve more than 46,000 gallons of gasoline and prevent the release of over 220 tons of greenhouse gas emissions.

It should be noted as well that because the streetcars are powered by electricity, it means that renewable energies may be used as a power source. In addition, cars will be outfitted with regenerative braking capacity, which enables them to produce some of their own power. Finally, streetcars operate more efficiently per passenger than do the city's current fleet of buses. Energy efficiency will be further improved by constructing stops that can be used by both buses and streetcars. As an aside, streetcar operations will be housed in a LEED (Leadership in Energy and Environmental Design)-certified facility.

Troubleshooting and Lessons Learned

The modern streetcar project did not begin easily or smoothly. In fact, the existence of a regional transportation plan became a reality only after four failed attempts. Although, the project leaders have just completed the design stages, they have encountered a number of challenges ranging from acquiring property to allaying concerns that the project will disturb sites of archaeological and historical significance.

The following section briefly summarizes these challenges and then proceeds to detail how the project team responded and addressed them. Yet, as Carlos De Leon, Regional Transit Authority services director, (personal communication, August 26, 2011) stated, "There is no getting around the fact that constructing a new transportation system in the middle of highly urbanized area is disruptive. When talking to constituents about this kind of project, don't sugarcoat this fact."

Partnerships and Patience

City and other regional leaders recognized early that some of the project's most acute effects would be felt by downtown business during project construction. In fact, the RTA has been working with local businesses for over four years and has held 6,000 meetings related to the streetcar program in an attempt to minimize the economic impacts of construction related disruptions. Main Street also offers consulting services valued at $6,000 to $8,000 at no charge to businesses and is also helping to plan a number of

downtown events (with the Downtown Tucson Partnership). Finally, downtown merchants also are offering a "Construction Customer Shopping Card" that provides customers with discounts who shop downtown during streetcar construction. Nonetheless, downtown business owners state that they need loyal customers now more than ever (Allen, 2012).

Property Acquisition

Because the project is taking place on mostly public right of ways (streets) and satisfies many of the city's land use and economic development goals, it has not experienced many difficulties relative to property acquisition. However, the east end of the system (university area) is located on the UA campus and, therefore, not subject to city regulations. However, the city avoided conflict by working with the university to incorporate its plans and concerns into designing the modern streetcar project route (City of Tucson, 2010).

Noise and Vibration

Construction projects often raise concerns amongst affected parties over how the noise and vibration may impact quality of life. In response and anticipating many of these issues, the city adopted a number of measures designed to mitigate the impact of construction on nearby properties. Each action or policy attempts to balance a resident's quality of life with the contractor's need to quickly, flexibly, and efficiently complete the project:

- Construction will take place during daytime hours.
- When possible, the use of equipment with enclosed engines and/or high-performance mufflers will be considered to reduce equipment noise.
- The city will place equipment and locate staging areas as far as possible from noise-sensitive areas. This will include routing construction vehicles and equipment away from residential neighborhoods.
- The city will limit idling of equipment and vehicles.
- Install noise barriers especially around stationary equipment, e.g. compressors and generators.
- If necessary, vibration may require that windows in a nearby sorority be replaced or upgraded to a sound transmission class of 30.*

The placement of the streetcar line near sensitive equipment housed at the university led some to worry about possible electromagnetic interference (EMI). Again, the city avoided potential problems by working with

* Sound transmission class is a rating system for sound insulation.

the university. The parties agreed to relocate the equipment to the Marley Building, which should not be affected by EMI. The city and UA also agreed to place the traction power substations (TPSS) at least 30 meters from any facility that contains other sensitive equipment (City of Tucson, 2010). This collaboration was especially important in securing the Transportation Investment Generating Economic Recovery (TIGER) grant (City of Tucson, 2010).

Bicycling

Project planners also worked with cyclists to identify and then to resolve potential conflicts with particular emphasis on areas near the university. In those areas with higher concentrations of bicyclists, streetcar tracks will be placed in the center of roadway.* In downtown neighborhoods, the streetcar will operate on the left, inside lane so that it may avoid interfering with bicycles and the existing angled parking on the outside of the roadway.† Finally, it will operate in semiexclusive right-of-way on the east side of Granada Avenue to lessen the impacts to the El Tour de Tucson bicycle race (City of Tucson, 2010).‡

Environmental Impacts

Although it is expected that the project will improve air quality and reduce pollution, it will still impact the environment. Specifically, runoff during construction, excavation, and the transportation of soil/dirt may all adversely affect water quality. The scope and severity of which, however, is unknown at this time and is related to a myriad of factors related to soil and weather. Noting these concerns and prior to construction, the city promulgated a Soil Erosion and Sediment Control Plan that adopts many stormwater best management practices (BMPs) that project managers believe will mitigate many environmental concerns.

The management plan involves a number of temporary and permanent BMPs to lessen stormwater impacts, the deployment of each, however, will be determined on a case-by-case basis. Stormwater BMPs often include the installation of both silt fencing and mulching. If necessary, the city and its contractors also will construct retention ponds, spill prevention and retention basins, interceptor ditches, and erosion mats. Less intensive means will

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* Center streetcar lines will be placed on Helen and 2nd Street, Cherry Avenue, and University Boulevard.

† Left, inside streetcar lines will be placed on Congress Street and Broadway Boulevard.

‡ In crafting these "solutions," the city worked with members of the Tucson–Pima County Bicycle Advisory Committee.

be employed as well: the wetting down of exposed or stockpiled dirt, street sweeping, the planting of vegetation, and the use of concrete wash-off containment facilities (City of Tucson, 2010). Finally, it should be noted that the city's Environmental Impact Statement, prepared by both city staff and its consultants, S.R. Beard and Associates, found no significant impacts to ecologically sensitive areas or endangered species as the project is located in a previously developed portion of the community.

Historic Identity and Archaeology

Again, because construction of the modern streetcar project will take place within existing development and right of ways, few, if any, sidewalks and buildings will be disturbed. However, the project will traverse over suspected archaeological sites. Again, noting this concern, the city, prior to construction, has worked with stakeholders and has agreed to clear or has already cleared sensitive areas west of Interstate 10. If potential sites are identified, the city will conduct archaeological monitoring as needed (City of Tucson, 2010).

Conclusion

As the case study demonstrates, transportation designed to both protect the environment while simultaneously increasing economic growth is often an arduous and challenging process for local governments. Yet, in order to become more sustainable and to meaningfully reduce their carbon footprints, local governments must address the transportation sector. This chapter, which examined the City of Tucson's 3.9-mile modern streetcar project, shows the promise of "green" economic development. The streetcar project may well prevent the release of over 220 tons of carbon while simultaneously helping to create over 1,500 permanent jobs. As Tucson's story shows, the marriage between economic development and sustainability is neither easy nor smooth, but by proactively working with partners, many problems can be avoided or overcome.

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II

IMPLEMENTATION: THE SUSTAINABLE ECONOMIC DEVELOPMENT TOOLKIT

While Section I of this book provided the theoretical and academic background to sustainable economic development, we now turn to more specific and narrow aspects of implementation. The following chapters will offer the reader methods and tools that are easily used in achieving sustainable economic development.

Chapter 5

The Greening of Public Administration

Important for the public administrator to understand is the fact that efficient and accountable public service is not contrary to the goals of sustainability. Public administration theory and practice has increasingly focused on the issue of sustainability. Within this context, the term *sustainability* refers to a principle of governing in which the needs of the present are met without compromising the ability of future generations to meet their own needs (World Commission on Environment and Development, 1987). The tenets of public administration are not significantly different from the principles of sustainability. In fact, good public provision and administration of services requires that resources are managed effectively in the short term so that risk is mitigated for future citizens (Leunberger, 2006, 200). These are not competing priorities. Sustainability and public administration are complementary ideals that are likely to influence each other for the foreseeable future.

The challenge for public administrators and nonprofit directors is to sustainably manage the provision of services and goods with increasingly limited and declining resources (Leunberger and Wakin, 2007, 394). The complexity of doing so occurs when professionals in both sectors attempt to identify and implement strategies that are in line with this new management ideology despite having little guidance on what it means to be sustainable or "green." In the same vein, the need to *green* economic growth or development has been added to the list of priorities when pursuing sustainability (Slunge and Loayza, 2012).

This chapter offers public administrators and nonprofit managers guidance on how to incorporate sustainability into their everyday practices to benefit the bottom line. It begins with an outline of the history of the environmental movement,

and then it discusses how sustainability has been implemented at the local level, with a focus on efficiency and effectiveness. The chapter closes with the concept in action illustrating examples of two localities that successfully incorporated sustainable practices into their operations.

History of the Environmental Movement

The environmental movement has developed over three distinct yet overlapping eras: (1) regulation for environmental protection, (2) efficiency-based regulatory reform and flexibility, and, (3) most recently, a movement toward sustainable communities (Mazmanian and Kraft, 2001, 8). Examining the movement through a series of changes in problem identification and policy approaches illustrates how we have arrived at a period of intense focus on sustainability, as well as the ways in which the central tenets of public administration and sustainability are now viewed as complementary. Each era has six key components:

1. Problem identification and policy objectives
2. Implementation philosophy
3. Points of intervention
4. Policy approaches and tools
5. Information and data management needs
6. Predominant political and institutional context (Mazmanian and Kraft, 2001, 8–10).

Regulation for Environmental Protection

Starting in the 1970s and lasting through 1990, the beginning of the environmental movement focused on development of an administrative and regulatory infrastructure to protect the environment (Mazmanian and Kraft, 2001, 8–10; Rajao, Azevedo, and Stabile, 2012). During this period, environmental degradation was conceptualized as a negative externality of commercial and industrial activity. The proposed solution was to create a set of laws and regulations requiring that businesses operate in an environmentally responsible way. However, during this time, political will and public support for such a framework were lacking. The high-priority policy objective at the time was to increase the public's awareness of these issues so they could gain legitimacy and find a place on the agendas of federal and state governments (Figure 5.1).

Most regulations and policies created during this period were directed at decreasing the amount of pollutants entering the environment at the point of impact (e.g., factory discharge into a river). The federal government exerted its dominance in protecting the environment during this period through a policy approach centered on command-and-control regulation; federal support for research and development

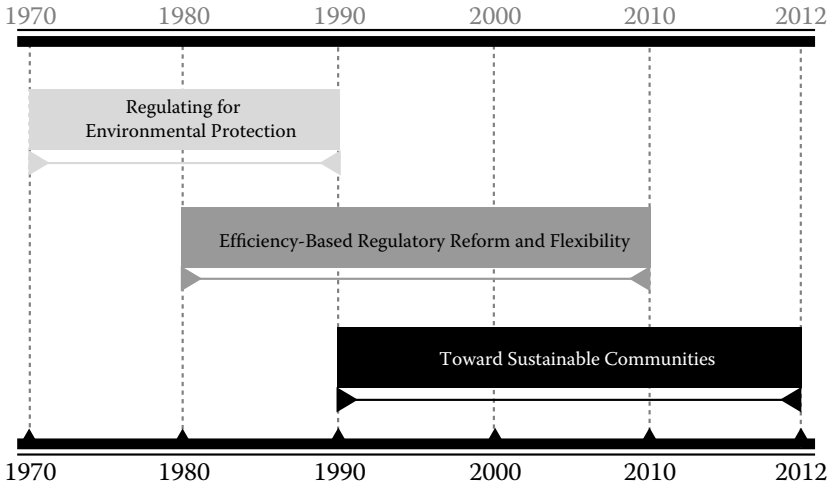

Figure 5.1 Timeline of the environmental movement in the United States.

to identify newer, cleaner technologies and methods of production; and creation of a body of research documenting the ill effects of pollution. Most evaluations of environmental degradation and the effectiveness of the emerging regulatory structure in stemming the tide were limited to firm-level emissions, the health effects of pollutants, and overall compliance rates with regulations and laws. In this way, the studies of the time were basic and rudimentary and were focused not on outcomes but on inputs and outputs.

The command-and-control approach to managing the environment significantly altered the political context in which government and business interacted. The relationship between the two became adversarial, which provides a key insight into a central assumption of the period that government was the only available method for changing private practices (Mazmanian and Kraft, 2001, 24).

Efficiency-Based Reform

In the 1980s and lasting through the 2000s, the environmental movement entered a period during which organizations sought to carry out new reforms efficiently and collaboratively. Economic and environmental development emerged as nonmutually exclusive goals, and emphasis began to be placed on the integration of the two during this period. Focus also shifted to social and economic issues, such as the effects of pollution on human health (Gibbs, 1991; Mazmanian and Kraft, 2001).

Given the more cooperative nature characteristic of this period, policy implementation shifted toward a reliance on market-based or collaborative mechanisms to incentivize environmentally responsible business and industry practices. Market-type policy implementation was thought to be essential to the sustainability

conversation because it opens regulatory frameworks to input from the private sector (Christopoulos, Horvath, and Kull, 2012). A clear and significant change occurred in the way government approached policy implementation to protect the environment.

Market-Based Policies

The shift away from command-and-control regulation toward market-based environmental policies was a significant development in the government toolkit in terms of policy implementation. In light of this, it is worth identifying several broad categories classifying the policy instruments that developed in this period. Moreover, the discussion may prove useful for the public administrator or nonprofit manager interested in pursuing or advocating for a similar method for addressing the environmental question.

As outlined in Figure 5.2, market-based mechanisms can be categorized into four broad groups: charge systems, tradable permits, market barrier reductions, and government subsidy reductions (Stavins, 1998, 4). All groups seek to create a market and force the internalization of the negative externalities associated with environmental harms. Charge systems and tradable permits are both monetary-based policy instruments designed to levy a fee or tax on individuals and/or firms that generate pollution (i.e., force internalization of the external costs of environmental pollution). Charge systems set the costs of pollution control, whereas tradable permits set an overall amount of allowable pollution. The theory behind both systems is that individuals or firms are incentivized to limit their impact on the environment because producing less pollution translates into lower operating costs and possibly higher income or profit margins. Tradable permits, however, reward firms that are able to limit their emissions or discharge by allowing them to sell or trade their permits to firms needing additional allowance for discharging pollutants into the environment.

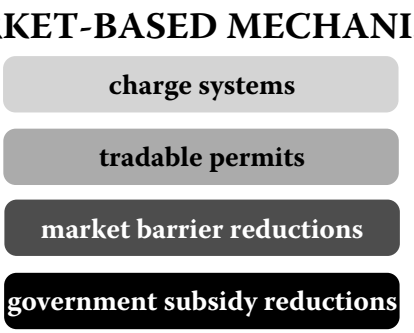

Figure 5.2 Categories of market-based mechanisms.

Market barrier reductions are instruments that do one of three things: create markets, enact liability rules, or establish information programs (Stavins, 1998, 4). In terms of efforts to create markets, this approach attempts to establish markets for finite resources where exchange and competition can occur, which leads to greater efficiencies in their use. Liability rules are laws and regulations that describe explicitly, in legislation or regulation, the extent to which individuals and firms are responsible for their impact on the environment. These rules can set a specific timeline to include retroactive liability where firms are held responsible for damage to the environment that is not identified until after the sale or transfer of contaminated land. When market prices are calculated based on incomplete information about pollution, producers and consumers cannot make good business decisions, which can be harmful to the free market (Ernst and Young, 2012, 4). Liability rules provide the market with clear information on the costs associated with damaging the environment and the resulting cleanup. The expected outcome of this additional information is that firms are less likely to engage in environmentally damaging activities, given the associated cost of and long-term liability for those actions. The third category of market barrier reductions includes programs that provide information to assist consumers in identifying products that are efficient or environmentally friendly, such as through product labeling. This approach enhances the market by allowing consumers to consider the true costs associated with the items they buy (Stavins, 1998, 5).

Government subsidy reductions is the last type of a market-based instrument and are designed to end financial support for activities that encourage the inefficient use of finite resources or harmful production practices. Examples include the end of fossil fuel energy subsidies or the below-cost sale of timber from public lands (Stavins, 1998). In both scenarios, the true costs are hidden or depressed for firms and eventually for the consumer. This encourages inefficient use and prolongs the research and development of alternatives. Thus, in areas where governments are subsidizing particular activities or market transactions, the marketplace is not able to find a point of equilibrium, where efficiencies tend to develop. The removal of subsidies is a backward incentive, in that removing the financial incentives encourages firms to seek more efficient alternatives.

Effects of Market-Based Policies

Each of the market-based mechanisms either provides clarity about the true market costs of damaging the environment or incentivizes the development of more efficient alternatives. Both approaches are clearly representative of this period's approach to policy implementation.

With a shift toward market mechanisms, the second period moved away from policies that intervened at the point of pollution. Instead, policies placed greater emphasis on multiple points in the production process, and each stage of the cycle

was evaluated for its overall efficiency and impact on the environment. Similarly, the policy approach became one of facilitation and oversight, where governments became creators and arbiters of these new and emerging market-based systems, and responsibility shifted to state and local governments. Information and evaluation during this period grew to be more sophisticated in terms of calculating the costs and the benefits of reducing pollution.

Whereas the first period's political environment was adversarial, the same is not true for the subsequent period of the environmental movement. Instead, this was a period of collaboration and participatory policymaking and rulemaking. The result was more negotiation, more alternative dispute resolution, and less legal action (Mazmanian and Kraft, 2001, 24–25). Moving away from the adversarial environment, the issue changed from disagreement on the benefit of protecting the environment to questions about how to implement policies practically (Glemarec and Oliveira, 2012). Similarly, the underlying assumption that government was the only actor able to change practices that led to negative impacts on the environment subsided. The assumption became one where business and industry could be partners that are motivated into acting in an environmentally responsible manner.

Focus on Sustainability

From 1990 through the present, the third phase of the environmental movement is characterized as creating a society in which systems and processes are evaluated based upon whether or not they are sustainable. This is a much broader and more comprehensive concept than the singular focus on environmental impact that guided the policies of the first two eras (Mazmanian and Kraft, 2001, 8–10). A single, authoritative definition of the term has yet to emerge, but the most commonly referenced definition of *sustainability* characterizes it as a balanced perspective where the needs of the present are met without compromising the ability of future generations to meet their own needs (World Commission on Environment and Development, 1987). Through the lens of this complex yet inclusive approach to managing the environment, policies attempt to go beyond regulating or limiting pollution to creating balance between current and future generational needs.

Sustainable policy implementation seeks out mechanisms that promote sustainable practices, but also strives to build institutions that are sustainable and to promote the concept internationally. Policies and processes move the point of intervention toward the societal level, which requires needs assessment and goal prioritization. Sustainability also provides greater emphasis on individual behavior and lifestyle choices, which is a clear departure from the previous two periods' predominate focus on business and industry.

The policy approaches of sustainable communities include comprehensive planning for the future and land-use planning that goes beyond the traditional fragmented and localized approach to include the regional, state, and even national levels. More so than the previous two periods, the move toward sustainable

communities is rooted in a political context that values collaboration, partnership, and community participation. This focus on participatory governance and inclusivity in decision making and deliberation creates a need for facilitators of the public discourse and dialog on the myriad issues that are examined when approaching sustainability from a community-wide perspective. Local public administrators and nonprofit managers will likely fill this role.

Given the ambiguity in defining what it means to be sustainable and the rudimentary framework that exists in terms of defining criteria and identifying indicators that allow communities to assess the extent to which they are sustainable, the third period of the environmental movement is still developing. We know that initial efforts in this area are promising, but insufficient. Over time—as technology improves and new methods allow us to predict the myriad affects of regulatory and personal actions—societies will be able to identify and select the most sustainable options available to them (Mazmanian and Kraft, 2001, 24). Until then, public administrators and nonprofit managers are forced to use the available approaches and make their best efforts at creating sustainable communities.

Sustainability and Public Administration

The three eras of the environmental movement provide public administrators and nonprofit managers with a set of benchmarks by which to identify where along this continuum of heightened environmental awareness their communities rest. These benchmarks can provide a basis from which to build a community conversation about sustainability. Most people believe that for sustainability to truly take root and persist into the future, meaningful and accountable participation from an inclusive group of actors is necessary (Kanie et al., 2012, 298). Given the increased focus on community participation in sustainability, public administrators and nonprofit managers are likely to become the needed facilitators. Thus, the complementary nature of public administration and sustainability materializes.

Consider the tenets of public administration within the context of new public service values. New public service values situate public administrators and nonprofit professionals as seekers of the public interest through a community dialog about shared values. This context emphasizes the role of government as a servant that negotiates and brokers interests; seeks to achieve policy objectives by building coalitions of public, nonprofit, and private agencies; and conceptualizes accountability as a multifaceted concept whereby law, community values, political norms, and professional standards are taken into consideration (Denhardt and Denhardt, 2007, 28). In addition to taking on the renewed focus on serving citizens and encouraging participatory government, public administration continues to value the tenets of social equity, efficiency, and effectiveness.

When comparing the tenets of public administration and sustainability, three values in particular overlap: efficiency, equity, and participation (Leunberger and Bartle, 2009, 5). Efficiency is a shared value in the sense that

sustainability and public administration both emphasize the efficient use of scarce resources. Equity is another overlapping ideal in that it and efficiency both seek equitable distribution of resources within and among communities, but also generationally in terms of having equitable access to resources for current and future generations. Last, both public administration and sustainability seek to foster inclusive communities where participation in the political and decision-making process as well as the identification of policy solutions is robust. In these ways and more, the key tenets of sustainability and public administration complement each other and overlap. Thus, as public administrators and nonprofit professionals carry out the practice of public affairs and public policy, they should understand that sustainability, in fact, is aligned with the values of their profession.

Sustainable Communities: Greening of Local Governments

Given the local focus of this book, most examples of sustainability are drawn from communities around the United States. Some of the efforts were made possible by federal support, so it is impossible to discuss local efforts without mentioning federal intervention. Even recognizing the important role federal intervention has played, localities are still emerging as leaders in the broader sustainability movement (Chifos, 2007; Environmental Protection Agency, 2005; Fercho, 2009; Hirokawa, 2009; Vercheick, 2003). This development is noteworthy for two reasons. First, public sector activity represents a significant portion of the U.S. economy, so it follows that the sustainability policies and services of the public sector have a large impact (Parrado and Loffler, 2010). Second, it is an important development when one considers that progress has been slow toward reaching a global agreement about environmental protection (Ostrom, 2009, 38). Thus, the solution is likely to be found in the collective efforts of multiple actors at different levels. As localities take up the cause and adopt sustainable practices, the politics of the environment shift from the international and national levels to the local level (Betsill and Bulkeley, 2006, 154).

Complicating the path toward more sustainable communities is the "tense relationship between the two central themes of sustainable development—the simultaneous desire for economic prosperity and environmental protection" (Jordan, 2008, 17). In fact, early debates were reductionist and framed in terms of either economic growth or no growth (Gibbs, 1991). Despite this seemingly difficult obstacle, sustainable practices can and do save localities money in both the short and long term. Those savings can contribute to a locality's overall economic condition. The following sections explore sustainability and economic development.

An underlying assumption of this chapter—and much of the integrative literature on sustainability and economic development—is that the economic benefits of sustainability practices "include cost savings through effective and efficient use of resources, less reliance on unsustainable energy sources, and new jobs and economic investment" (Geary, 2011, 1). Thus, much of what is discussed in terms of the economic benefits of sustainability is done so with an eye toward the triple bottom line of social responsibility, environmental protection, and economic growth (Zeemering, 2009, 249).

Local Government Sustainability Toolkit

Local government can engage sustainable policies and practices through both direct and indirect actions (Holst, 2009, 91).

Direct Action

Direct actions by a locality involve modifying the impact that its operations and processes have on the environment. Examples include retrofitting municipal buildings to be more energy efficient, implementing green procurement processes, and modifying human resource functions by incorporating sustainable practices. Direct actions can be further classified as either internal or external (Holst, 2009, 92). Internal green actions are those that are not specifically related to the provision of a service to the public. The greening of a locality's human resources plan is an internal action because the human resource function is necessary to the administration of the municipality, but is not designed to provide a goods or service to the public. External green actions involve modifying a municipality's direct provision of goods or service to the public in a way that makes it more sustainable. An example is a local transportation system switching from nonrenewable to renewable fuel sources.

Indirect Action

Indirect actions are those that localities take to create opportunities or incentives for their communities to adopt sustainable practices. Three types of indirect actions exist: legal or regulatory action, economic action or incentivization, and social action or information provision (Holst, 2009, 91; Li and Li, 2012).

Regulatory indirect action includes such programs as municipal ordinances establishing requirements around water and energy conservation for construction projects. Examples include municipal green building ordinances that require projects to comply with the Leadership in Energy and Environmental Design (LEED) certification standards. For instance, the Borough of West Chester, Pennsylvania, is the first municipality in the United States where, by ordinance, private commercial buildings requiring conditional use approval must be designed in accordance with ENERGY STAR policies. ENERGY STAR is a joint program of the U.S.

Environmental Protection Agency and U.S. Department of Energy that establishes energy efficiency standards (Borough of West Chester, 2008).

Economic indirect actions include a broad array of tools that provide financial incentives for complying with sustainable practices or requirements. According the U.S. Green Building Council, there are four broad categories of financial incentives: tax credits or abatements, fee reductions or waivers, grants, and revolving loan funds (U.S. Green Building Council, 2012). Tax credits are specified reductions in municipal tax liability for individuals or firms complying with municipal sustainability guidelines, and abatements provide exemptions for a period of time in exchange for compliance. For example, Cincinnati, Ohio, provides for an automatic, 100% real property tax exemption for newly constructed residential, industrial, and commercial properties for a period of 15 years. In this way, the city provides a financial incentive for both residential and commercial developers to comply with the certification requirements of the ordinance. Fee reductions or waivers are commonly applied to development projects that voluntarily submit to using sustainable practices. The town of Babylon, New York, allows developers who construct commercial space or multifamily housing over 4,000-square-feet to be reimbursed by the town for fees associated with LEED certification.

Grants provide developers and owners with access to capital for projects complying with a predetermined set of sustainability standards. King County, Washington, provides grants ranging from $15,000 to $25,000 for both new construction and renovation of buildings inside the county, but outside the city limits of Seattle.

Revolving loan funds offer developers the ability to tap into a pool of low-interest loans to support the up-front costs that are typically cited as a barrier to pursuing certification or sustainable building practices (Merritt and Stubbs, 2012). An example is the Milwaukee Energy Efficiency program, which offers residents and building owners access to financing for energy-efficiency retrofits without any up-front costs. Participants pay back their loans in monthly installments, which are manageable due to the savings in energy costs.

Social action, the last category of indirect action, is accomplished by creating awareness in the community through communication, including through digital and social media (Holst, 2009, 96). Cities such as Santa Monica, California; Kansas City, Missouri; and Philadelphia, Pennsylvania, have extensive sustainability plans, Web sites, and social media presences on the topic. Another example is the Listening to the River project in the Grand Traverse, Michigan, area, which is an education effort where teens use digital media to gain an understanding of watershed concepts and characteristics. The program provides students with links between technology and watershed science. While there are many goals associated with the program, its aim of instilling a sense of awareness and understanding of watershed issues and proper stewardship is a particularly illustrative example of the use of social action.

As is readily apparent, local governments have a number of approaches available to them when pursuing a sustainability agenda. Public administrators and nonprofit managers can seek a balanced approach to creating the framework from which to move their communities toward a more sustainable future.

Green Procurement and Human Resource Management

Green Procurement

Leading by example is one way of encouraging the broader community to adopt sustainability practices (Marron, 2003). Within this context, state and local governments have begun to demonstrate leadership by evaluating their internal processes in terms of their sustainability. Recently there has been a noticeable increase in the number of governments that have implemented sustainable operations practices (Bansal and Roth, 2000; Rangarajan and Rahm, 2011; Thomson and Jackson, 2007).

One such example is green procurement practices (GPPs), or policies and procedures that require environmental factors be considered when choosing distributors and products (Green, Morton, and New, 2000; Gunther and Scheibe, 2006; Lemos and Giacomucci, 2002; Min and Galle, 1997). GPPs focus on purchasing materials and products that are made of recycled or renewable sources, are energy efficient, or contain fewer toxic chemicals (Lemos and Giacomucci, 2002). Some GPPs support the purchase of green products even when they cost more than the alternatives, while others seek out procurement strategies where both environmental protection and cost savings are realized. GPPs that provide for price preferences of greener products are noteworthy in that they emphasize environmental concerns over costs. However, it is also possible to seek green alternatives without negatively affecting the economic bottom line.

Examples of GPPs

Instances where localities have been successful in finding cost savings and green products include Alameda County, Palo Alto, and Santa Rosa, California (Alameda County Waste Management Authority, 2012). Alameda County's General Services Agency located a paper supplier that offered 30% recycled content at a 20% cost reduction as compared with nonrecycled paper. Palo Alto established a return on investment (ROI) tool and was able to identify a $1.3 million ROI when purchasing and installing light-emitting diode (LED) technology in streetlamps. Santa Rosa switched to an environmentally friendly transmission lubricant for city vehicles that has to be replaced less frequently than the alternative. By doing so, the city has realized savings of $25,000 per year in labor costs.

An example from another region is Hennepin County, Minnesota, which doubled the amount of money spent on green products from 24 to 48% and experienced a 10% savings in comparable costs (Kuranko, 2010). In other areas, economic

benefits have been realized by pursuing sustainability through the purchase of reusable materials, use of efficient technologies that reduce electricity demand, and implementation of water and fuel and policies that lower healthcare costs by reducing exposures to toxic chemicals and products (Legault, 2001).

How to Create a GPP

Public administrators, nonprofit managers, and agencies can use a set of successive steps to start a green purchasing program (National Association of State Procurement Officers, 2012). The first step is to identify a leader who will manage and guide the process and eventually the program when formed. Next, it is recommended that organizations start small, even in the face of advocates for wholesale change. After that, a set of baselines should be identified that provides clear information on where the organization is currently in terms of purchasing practices. Additionally, benchmarks should be established that take into consideration best practices from similarly situated organizations. For many organizations, these benchmarks will serve a dual purpose as both indicators of best practices and goals for the procurement program.

After identifying the team, collecting relevant baseline data, and establishing benchmarks, it is time to involve stakeholders in the process. These individuals will help to identify the most acceptable methods of implementation and may serve as test subjects for proposed policies. It may be necessary to engage stakeholders in a hurdle analysis to identify and propose solutions to potential barriers to implementing a GPP (Gunther and Scheibe, 2006).

At this point, management should be included and convinced of the process so that they provide support at critical junctures during implementation. It also can be argued that management support should be solicited at the beginning of the process. However, organizations need to weigh the value of identifying a base of support before incorporating or seeking management support.

The next step is to create a measurement and evaluation system that will help to track progress in terms of meeting the goals. Incorporating the baseline data and benchmarks in this stage will aid in building a case for the program's success. After collecting data on the program's performance, organizations can reward their supporters and market their successes. Last, it is important to seek out existing resources and look to similarly sized organizations that have successful green programs. By leveraging the experiences of others, organizations can enjoy the benefits of tested processes. They are less likely as well to be overwhelmed than they would be if starting from scratch and encountering failures.

Green Human Resource Management

Human resource management is another area where localities and agencies have tried to incorporate sustainable practices. Private sector businesses have a head

start on public sector organizations in the greening of human resources, but evidence suggests that public sector human resource management is beginning to follow suit.

Administrative Changes

In a recent study, public sector human resource professionals most commonly reported moving to electronic files, electronic document imaging, and a fully paperless personnel system (Rangarajan and Rahm, 2011, 242). There are upfront costs associated with moving to such systems, but they lead to long-term cost savings in regard to reduced paper consumption, reduced amount of waste needing to be removed, and decreased labor costs, as workers spend less time filing and searching for documents than they do with traditional paper systems.

Changes to Promote Wellness

Sustainability is strongly related to the health and wellness of a workforce. As individuals become healthier, absences (and the resulting lost productivity) decrease. An excellent example is the University of Louisville's wellness program, Get Healthy. Individuals participating in this program qualify for a $40 per month insurance premium reduction. Before implementing the program, the university faced healthcare costs that outpaced the national average (University of Louisville, 2009). After implementing this voluntary program, the university now enjoys a 2.67 ROI, which means that for every dollar it spends on the wellness program, it saves $2.67.

In 2010, to make the connection between sustainability and the health and wellness program, the University of Louisville implemented the Green Health Initiative. This program was based on research that indicated individuals were more likely to participate in the program when their actions were perceived to have an impact on the environment (Healthwire, 2011). The initiative awards points for participation in environmentally sustainable choices, including gardening, community-supported agriculture, and bike-to-work initiatives. In each of these cases, the university is encouraging participation in an environmentally friendly practice while reducing its bottom line by lowering the healthcare costs associated with insuring its workers.

Following the Private Sector

Practices that have been adopted in the corporate world are easily adoptable by public sector organizations. According to a recent survey of private sector human resource professionals, organizations have shifted to Web or teleconferencing to cut down on business-related travel (Buck Consultants, 2009). When considering mileage and fuel costs, as well as maintenance of a readily available fleet associated

with employee travel, a reduction in trips through the use of technology can easily help with the bottom line.

Many organizations have moved their insurance summary plan descriptions online (versus providing them in printed form). Others offer opportunities for employees to work from home, which cuts down on physical space and electricity needed to support workers in the office. In each of these areas, human resource management has become a key area where public sector organizations are adopting their own innovative strategies or are building on the work of the public sector to introduce sustainability into their agencies.

Indicators of Sustainability

A significant trend associated with the pursuit of sustainability is the development of a system for measuring the environmental impact of policy and the extent to which sustainability goals are being met (Keen, Mahanty, and Sauvage, 2006; Meadowcroft, 2000, 376; Sarkis, 1999; Satterthwaite, 1997; Upadhyay and Brinkmann, 2010). The Sustainability Plan of Santa Monica, California, is a prime example of how a community developed both a sustainability plan and a comprehensive framework from which to evaluate the plan's effectiveness. This example is important in that the city embraced a process that moved beyond aspirational goals to goals with clear indicators and targets. The city's evaluation framework allowed officials to identify improvements at the level of both systems and individual programs and activities.

Santa Monica's Sustainability Plan

Adopted in 1994, the sustainability plan of Santa Monica, California, has been revised twice, most recently in 2006. The goal of the plan is to enhance the city's resources, reduce harm to the environment and human health, and benefit the social and economic well-being of the city with regard to current and future generations (City of Santa Monica, 2006). In seeking to enact a comprehensive plan, the city identified eight goal areas. Within each area are the specific goals that have been identified as important to becoming a sustainable city. These areas include resource conservation, environmental and public health, transportation, economic development, open space and land use, housing, community education and civic participation, and human dignity.

Types of Indicators

For each goal area, the city created indicators that would provide clear information on the condition of the area or the impact of policy or action. Indicators were broken into two categories: system- and program-level indicators. System-level indicators provide information on the current condition of a particular goal area.

Program-level indicators track the performance or effectiveness of efforts in the goal area toward increasing its sustainability. The city also established a target for most of the indicators so the program could work toward clear, definable goals. The goals of resource conservation and economic development provide examples of well-designed indicators that are easily modifiable for any locality.

Resource Conservation

Resource conservation is aimed at reducing overall community consumption of nonlocal, nonrenewable, and nonrecyclable materials; water; and energy and fuels (City of Santa Monica, 2006). System-level indicators include solid waste generation, water use, energy use, renewable energy use, greenhouse gas emissions, and the ecological footprint for Santa Monica. Program-level indicators include the amount of green construction occurring within the city limits.

In terms of solid waste generation, the city established three subindicators: total citywide generation of solid waste, amount landfilled, and amount diverted from the landfill. For waste generation, the city set a goal of not exceeding levels measured in the year 2000. For diversion, the goal was to increase the amount of solid waste recycled or composted to 70% of total waste generated.

Economic Development

The economic development goal area focuses on fostering a diverse, stable local economy that supports the basic needs of the community (City of Santa Monica, 2006). The system-level indicators for this goal area include:

1. Economic diversity
2. Business reinvestment in the community
3. Jobs–housing balance
4. Cost of living
5. Quality of job creation
6. Income disparity
7. Resource efficiency of local businesses

One of these indicators is worth noting. Economic diversity measures the percentage of the total economic activity of the city per business sector. The city set a goal to create a community where no sector will make up more than 25% and the top three sectors will not exceed 50% of the city's total economic activity. The city hopes to make its local economy more sustainable by limiting any one sector's ability to severely disrupt the economic activity of the entire city.

The Importance of Indicators

Indicators provide concrete evidence that the investment of time and effort in sustainability activities is worthwhile. Since implementing its sustainability plan, the City of Santa Monica has been able to provide specific information on how its programs are contributing to improving both the environment and the sustainability of the community. Indicators also speak to the community; they help citizens understand what problems the community is facing and show how the local government is working with multiple stakeholders to bring about change (Redefining Progress, 2006).

Conclusions and Concepts in Action: San Antonio, Texas, and Philadelphia, Pennsylvania

The greening of public administration is relatively recent, dating back to the 1970s. Since that time, attention to the issue of sustainability in local government administration has increased exponentially. This chapter and those that follow provide public administrators and nonprofit professionals with a clear idea of what tools are available to them as well as information on specific areas where sustainable practices can be implemented into organizational process while contributing to overall economic development.

The following case studies translate the concepts from this chapter into real-world examples. The first examines San Antonio, Texas' approach to incorporating sustainability into its operations. Beyond that, the city clearly articulates a plan for pursuing economic development that shares common ground with the principles and ideals of sustainability. The second case explores the Philadelphia Water Department's use of sustainable technologies and practices to increase the city's economic development potential in a number of areas. Both cases are prime examples of the emerging framework by which localities are seeking the pursuit of economic development and sustainability simultaneously.

MISSION VERDE: SAN ANTONIO'S GREENING OF GOVERNMENT OPERATIONS

In recent years, the City of San Antonio has moved in the direction of becoming a green community. The formal beginning of this movement came February 4, 2010, with the adoption of the Mission Verde Sustainability Plan. This plan is aptly named, drawing on the city's tradition of Spanish missionaries and applying it to a new initiative. (*Verde* means *green* in Spanish). Mission Verde's first draft included 10 initiatives:

- Creation of a twenty-first century energy infrastructure
- A high-tech venture capital fund
- A green jobs program
- Economic development strategies
- A green building code for new construction
- A green retrofit program
- Transportation initiatives
- Sustainable real estate development
- A green one-stop center named Mission Verde Center
- City internal initiatives (San Antonio Office of Environmental Policy, Mission Verde Sustainability Plan, 2010a)

The city council subsequently expanded the focus of Mission Verde to include water conservation, waste reduction, alternative transportation fuels, compact and low-impact development, historic preservation, tree cover and green space, and locally produced food (San Antonio Office of Environmental Policy, Mission Verde Update, 2010b).

All city units participate, and the city's Office of Environmental Policy (OEP) oversees tracking, monitoring, and annual reporting. The data for this case study were drawn primarily from content analysis of the revised Mission Verde Sustainability Plan, the City of San Antonio Sustainability Inventory, the Leading by Example rubric, and an interview with W. Laurence Doxsey, Director of the OEP.

Community Greening Initiatives

San Antonio's energy and water initiatives focus on conservation and use of clean and renewable resources. A weatherization assistance program focuses on weatherization of thousands of homes through the Casa Verde initiative, which is run by CPS Energy. A small-business lighting efficiency program provides millions of dollars in revolving loan funds to help small businesses convert to energy-efficient lighting. A "green shade" program provides rebates for 6,000 trees that shade buildings and, therefore, reduce energy use. In an initial effort, the Mission Verde Center installed a solar electricity system. An associated green jobs initiative focuses on creating jobs and markets for green technologies.

Land Use and Transportation

In the area of buildings and neighborhoods, the city improved its building code and is targeting increases in housing stock with net-zero energy use by 2030. The mayor's task force on sustainable buildings focuses on new

construction and rehabilitation of older buildings. A green contractor rebate program provides rebates for major home upgrades that improve energy performance. Additionally, the city seeks to partner with the U.S. Department of Housing and Urban Development (HUD) through application to HUD's Sustainable Communities Regional Planning Grant program.

San Antonio's transportation and land-use initiatives focus on creating a green transportation hub, mass transit-oriented development, and walkable urban neighborhoods. Electric vehicles are highlighted, and electrical vehicle charging stations have been installed across the city. Bicycle use for transportation is encouraged through the use of a downtown bike-sharing program that allows users to pick up a bike, ride, and deposit it at another location. Bicycle safety issues were highlighted in a media campaign.

Community Outreach

Community outreach efforts were concentrated in the Mission Verde Center, which was opened by Mayor Julian Castro in January 2010. The main aims of the outreach effort include education and communication to improve sustainability, along with providing virtual resources for green improvements. The local community colleges work with the Mission Verde Center to provide green classes and promote education for green jobs. A citizens' environmental advisory committee was created to communicate with the city council to assure the success of Mission Verde.

Water Conservation

San Antonio is similar to many cities in its municipal provision of water. The San Antonio Water System (SAWS), however, has a long history of sponsoring water conservation efforts and unique programs to increase supply. These efforts are motivated by the city's arid climate and the overwhelming dependence on the Edwards Aquifer for its water supply. SAWS continues to attempt diversification of water supply by targeting other aquifers and some sources of surface water available regionally. In 2004, SAWS put in place an aquifer storage and recovery program that pumps water from the Edwards Aquifer during wet times and stores it in the Carrizo Aquifer until drought conditions occur, at which point the water is pumped back into the Edwards Aquifer for use.

Conservation programs play a key part in keeping water use low. Despite a doubling of the population between 1987 and 2007, San Antonio's water use has remained surprisingly flat. SAWS conservation efforts include providing free low-flow toilets to customers, giving cash rebates for purchases of water-saving appliances, and promoting water-saving plants and landscaping. In addition, SAWS has implemented an innovative wastewater recycling

program that is the largest in the United States. SAWS maintains over 100 miles of pipes under the city to deliver high-quality recycled water for use by industry, golf courses, parks, and San Antonio's well-known River Walk. SAWS's most recent effort linked to Mission Verde's energy strategies is to collect methane produced during the water recycling process. The methane is then sold on the open market to natural gas customers (San Antonio Water System, 2012).

Energy Conservation

San Antonio is unique among other large cities in that it has the nation's largest municipally owned energy provider, CPS Energy. CPS Energy runs a series of rebate programs to improve both conservation efforts and air quality. Its Clean and Green program aims to reduce emissions from older, inefficient gas mowers. CPS Energy also helps to promote cleaner air by making available electric vehicle charger stations within the city for use by electric vehicles. Other conservation rebate programs include the programmable thermostat rebate program, the energy-efficient appliances program, and the energy-efficient light bulb program.

While coal still provides nearly half of the fuel mix used by CPS Energy, the organization is enlarging its renewable-energy fuel sources. CPS runs the Save for Tomorrow Energy Plan (STEP), which focuses on demand reduction, with a goal of reducing demand by the equivalent output of one power plant (771 megawatts) by 2020. As another part of STEP, CPS Energy has committed to providing more than 400 megawatts from solar sources alone. A primary goal of STEP is to have a renewable energy capacity from wind, solar, and landfill gas equal to 20% of its total generation capacity by 2020 (CPS Energy, 2012).

Greening of City Departments

San Antonio's multipronged greening effort has been spearheaded by two distinct entities: the OEP and the Sustainability Task Force (STF). The efforts of the OEP in general and the STF in particular are supported by multilevel government grants. Several of these initiatives have received close to $37 million in financial support from federal and state entities, such as the U.S. Department of Energy, U.S. Centers for Disease Control, Texas Department of Transportation, and Texas State Energy Conservation Office (San Antonio OEP, Mission Verde Update, 2010b).

While the OEP is the main entity that steers the city's diverse greening efforts, the STF has the explicit responsibility of guiding city departments to adopt best practices. The STF was created in 2008 to coordinate the city's

operational sustainability efforts in three areas: environmental, economic, and social (San Antonio OEP, 2012). The overarching goal of the STF is to communicate to its various stakeholders, such as citizens, community groups, and businesses, that city management is willing to lead by example.

The strategic composition of the STF is aimed at securing city departments' commitment to green initiatives. The city's chief information officer leads STF, which brings together directors of seven key city departments (capital improvements, management services, finance, fleet maintenance and operations, office of management and budget, purchasing and contract services, and solid waste management). STF provides a forum for city departments to meet, discuss, share knowledge and information, collaborate, and publicize their intra- and interdepartmental greening innovations.

Initiatives under the Leading by Example rubric are central to this case study. All city departments, agencies, grantees, and units fall under this initiative. The focus extends to buildings and equipment, procedures, and operations as well as goods produced and services provided (San Antonio OEP, Mission Verde Sustainability Plan, 2010a).

Leading by Example

Recycling Initiatives

One of the biggest ways that City of San Antonio departments have shown their commitment to green management is through adoption of rigorous recycling strategies. Departmental recycling efforts can be categorized into four strategies: rigorous self-assessments to understand consumption and recycling patterns, aggressive outreach to spread recycling best practices, deliberate procurement of products made from recycled material, and conscious recycling of used products.

In terms of assessments related to recycling, the Solid Waste Management Department has conducted waste characterization studies to facilitate recycling of new materials that are not typically recycled. Convention, Sports, and Entertainment Department facilities in the city are constantly assessing the recycling potential of products used in their facilities. The Purchasing and General Services Department helped to streamline recycling procedures at city hall, the Municipal Plaza Building, and other areas (San Antonio OEP, 2009). The Department of Economic Development is rigorously evaluating workforce opportunities in the recycling industry as part of its initiative to identify companies that create green jobs.

As an example of outreach efforts related to recycling, the Solid Waste Management Department has revamped its Web site to promote recycling efforts. Apart from Web site enhancement, the department also introduced

Carter, a two-cart recycling bin mascot created to educate citizens about the importance of proper recycling. The Solid Waste Management Department is also collaborating with nonprofit entities, such as the San Antonio Corporate Recycling Council, Sierra Club, and Keep San Antonio Beautiful, to spread its recycling message to the community. The Aviation Department placed recycling bins throughout airport concourses and offices. Convention, Sports, and Entertainment Department facilities are equipped with recycling bins at every possible office and employee break room to facilitate recycling of paper, aluminum, plastic, and glass.

Procurement of recycled products for city use has been a regular practice. According to the OEP, 23 city departments actively procure recycled products whenever possible. The Solid Waste Management Department, for example, procures office supplies from Office Depot's Green Book. Its business cards are printed on recycled paper, and the printer paper used in the offices is recycled. The Department of Purchasing and Contract Service also uses recycled paper for all of its printing.

The City of San Antonio's conscious recycling of used products is illustrated by the efforts of several departments. The Fleet Maintenance and Operations Department recycles used motor oil, antifreeze, automotive batteries, and metal scrapings. The library has switched from paper to electronic notices to library patrons, eliminating 174,000 paper notices per year. The Solid Waste Management Department's human resources reporting process has moved from paper to electronic, reporting thereby eliminating paper waste. The Public Works Department recycles aluminum sign plates by reusing them.

Energy Conservation and Alternative Energy Strategies

City departments have embarked on a number of energy conservation strategies. The most significant initiative in this regard was undertaken by the Purchasing and General Services department, which chose one preferred vendor to simplify the energy-efficient retrofitting of city buildings (San Antonio OEP, 2009). All city departments or facilities interested in making their lighting systems more energy efficient contacted the state-approved vendor, who would take care of the entire set of procedures. The Police Department, in conjunction with Purchasing and General Services, has made energy-efficient lighting changes to six police stations and the police academy.

The Solid Waste Department is using compact fluorescent lamps for all office lights. Information Technology Services replaced standard light switches with keyed switches to keep lights turned off when no one is present in the office. The Aviation Department is also using automatic lighting controls, as well as daylight sensors to conserve energy during daytime when sunlight naturally illuminates facilities. Airport runway lights were converted

into LED lights to conserve energy. Almost all city departments are adopting stringent measures to conserve energy, through lighting retrofits, efficient programming of air conditioning units, and other strategies.

In addition to the efforts of CPS Energy, San Antonio's commitment to exploring alternative energy solutions is demonstrated by its numerous solar, wind, and alternative fuel strategies. The city has shown a sustained commitment to solar energy. San Antonio hosted the national solar conference for U.S. solar city designees in 2009. The Parks and Recreation Department and OEP host an annual Solar Fest, a celebration of renewable energy that includes exhibits, a road race, and live music. The city's OEP has been exploring solar city grant opportunities to fund its innovations. The city also has partnered with nonprofits, such as Solar San Antonio and the Metropolitan Partnership for Energy, to enhance solar capabilities.

Several city departments have shown their commitment to solar energy. The Aviation Department has harnessed the potential of solar light to increase visual transparency and the amount of light in the curb-front facade of ticketing halls. The Aviation Department also has outfitted its maintenance golf carts with solar panels to minimize the use of electricity. Similarly, the Convention, Sports, and Entertainment Department is exploring options to equip the convention center roof with solar panels. The Public Works Department has changed flashing lights at schools from incandescent to solar. The Fire Department has, through a U.S. Department of Energy grant, installed a solar water-heating system in one of its prominent fire stations.

The Economic Development Department has chosen to incentivize businesses based on their commitment to wind energy and, thereby, advance the city's alternative energy plans. The Convention, Sports, and Entertainment Department is considering wind power options. The John Igo Library has a new fountain that is powered by wind energy.

To reduce the city's reliance on gasoline, the Fleet Management Department purchased a combination of hybrid electric sedans, hybrid sedans, and plug-in hybrid vehicles. Fleet Management has also secured sedans powered by natural gas and light duty trucks powered by propane. The city encourages hybrid taxi fleets by offering them special permits and encourages citizens to purchase hybrid vehicles by offering free parking for individually owned hybrid vehicles.

Green Building

The City of San Antonio aspires to be a leader in green building. The city's green building initiatives consist of four broad strategies: training, city commitment to green building, incentives for green building, and partnerships with private and nonprofit entities. The city architect's office is keen on

ensuring that all of the new city buildings achieve the LEED Silver standard. Aviation Department architects have attended LEED training programs and toured buildings with LEED certification to learn about the intricacies of green building. The Economic Development Department is providing incentives for LEED-certified projects, including 100% abatement of real and personal property taxes for buildings with LEED certification.

The OEP has encouraged green building initiatives by providing free or discounted training opportunities, scholarships, and sponsorships for city employees to attend LEED training courses. OEP has also hosted the Green Leadership Awards to recognize innovations in local green building. In addition, the city partners with Build San Antonio Green, a local nonprofit that collaborates with other nonprofits, government, and local businesses to promote green building initiatives.

Mission Verde and Leading by Example: An Interim Assessment

Mission Verde and the Leading by Example initiatives are reasonably new, but it is worth asking how well they are doing so far. This assessment draws heavily on data gathered through an interview with OEP Director W. Laurence Doxsey. Of particular interest are factors that serve as barriers or facilitators of Mission Verde, organizational and budgetary dynamics that affect Mission Verde, and the key drivers of buy-in to Mission Verde's vision.

Barriers and Facilitators

Mission Verde is facilitated by the active support of policymakers, especially when they are able to articulate a compelling economic development message. The notion that Mission Verde's efforts will result in jobs and growth is an important factor to its continued success. However, the momentum is not always smooth. As in most large cities, multiple competing interests among departments can result in diversions that pull staff in other directions. This can result in interference from focusing on interdepartmental coordination and integration of Mission Verde operations.

Organizational and Budget Dynamics

On the intergovernmental level, the vision and agenda of Mission Verde is received well by officials. Cooperation exists at both the state and the federal level. Mission Verde also has strong relationships with the nonprofit community. Three active nonprofits—Build San Antonio Green, Solar San Antonio, and Mission Verde Alliance—have positive relationships with Mission Verde. The nonprofits do not directly impact the city's internal Leading by Example initiatives, but they assist Mission Verde's efforts by keeping it visible among

the city's departments. Each department is required to submit a sustainability plan for its operations to the OEP. Among the city's 40 departments, support of this effort varies from grudging compliance to enthusiastic, innovative participation. Also, when Mission Verde is able to communicate a strong economic development message, robust relationships are maintained within the city's business community.

Budgetary dynamics are an important consideration in the success of Mission Verde. Federal stimulus funds were used to begin numerous programs under Mission Verde. Water and energy upgrades may soon be assisted by an internal revolving fund that has been seeded by federal funds. If successful, the city will be able to reinvest savings to continue water and energy improvements. City fleet purchases are required to comply with a life-cycle cost analysis, which includes environmental impacts. In the past, only low-cost environmental improvements have passed muster, but the rising price of gasoline has made the acquisition of hybrid vehicles more attractive. The city also has been able to expand recycling on the River Walk and install LED lighting there. The city's annual Fiesta events are required to comply with the city's Green Events Ordinance that calls for multiple green measures.

Drivers of Buy-In

The key driver of buy-in to Mission Verde's agenda in the community is economic development. From the civic perspective, the changing nature of energy is widely accepted, and there is support for the city positioning itself to take advantage of those changes for job creation and cost savings. A key factor driving support of Mission Verde among city staff and elected officials is the potential for budgetary benefits. If Mission Verde can leverage funding, it is widely supported. Also, the vision of Mission Verde is widely accepted by the city's influential municipal electric and gas utility, CPS Energy, as well as by the municipal water supplier, SAWS. The utilities' alignment with Mission Verde's policies is a key reinforcing factor.

Summary

Mission Verde has been instrumental in bringing together multiple stakeholders, such as the community, businesses, nonprofit organizations, policy-making entities, and city departments, to work toward the common goal of greening the city. This initiative has been comprehensive and, therefore, is making a significant impact on various dimensions of life in San Antonio.

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THE PHILADELPHIA WATER DEPARTMENT

Across the United States, both large and small cities are having a difficult time paying for an aging water infrastructure. The challenge is that traditional forms of funding are running out. In the 1970s and 1980s, the federal government issued large grants to local governments to improve their water and wastewater systems. Currently, there is not enough funding available to meet the increasing demands that an aging infrastructure has placed on local water services. Today, federal assistance helps water systems meet only a small portion of their costs, with most of that assistance going to smaller communities.

Given that many water systems have an aging infrastructure, agencies are deferring maintenance and replacement and are left with systems that need renovation. This is especially true for local governments that manage wastewater and sewage treatment programs. Making improvements to these systems would support communities in the long term, but it is becoming difficult because funding is low.

However, there is more to a modern local government's environmental program than advanced water treatment centers. Broad initiatives encourage saving energy, recycling water, conserving wildlife areas, implementing education programs, and more. Some sustainable programs even support revenue generation, the growth of green initiatives, and creation of local jobs and businesses. Public expectations and regulatory authorities are placing increased pressure on cities and municipalities to manage their water resources sustainably, including during wet weather conditions. However, there is no one-size-fits-all approach.

Local government, rather than the federal government, assuming leadership of environmental protection is a long-term solution to the problem of environmental health. Local governments possess several capabilities that make them well suited for dealing with environmental issues. This case study demonstrates how the Philadelphia Water Department is improving its overall performance in terms of incorporating sustainable practices while also generating long-term cost savings and economic development.

Background

The Philadelphia Water Department (PWD) is one of the oldest municipal water utilities in the world, with almost 200 years of uninterrupted service to the city. Today, PWD provides the Greater Philadelphia region with integrated water, wastewater, and stormwater services. PWD's commitment to collecting stormwater and treating wastewater ensures the health and vitality

of the Delaware and Schuylkill Rivers and the numerous creeks and streams in the city.

PWD, like many water departments across the country, is confronting complex environmental, demographic, and financial challenges while trying to meet expanded customer expectations for a safe and affordable water supply and efficient treatment of wastewater and stormwater. Unlike in other areas, PWD has expanded its mission, seeking to become the steward and protector of Philadelphia's rivers and streams. Meeting these challenges requires a paradigm shift in approach to urban water resources.

The current water infrastructure in the City of Philadelphia is the product of a water and wastewater distribution system that has been evolving for almost two centuries. It is also the product of an increasing number of environmental laws and regulations. Accordingly, Philadelphia's current water infrastructure network is the result of an iterative process marked by constant modification and replacement.

Managing Stormwater

When rain and melting snow carry pollution into waterways, it creates stormwater runoff. Roads, buildings, and parking lots prevent water from soaking into the ground and can cause flash flooding to local waterways. High volumes of stormwater also can overwhelm municipal treatment facilities. PWD is trying to reduce amounts of stormwater by changing city parks, roads, and other structures to be able to absorb water more efficiently and naturally. This will allow rainwater to be filtered and processed more easily and assure safe and clean water.

As part of the Clean Water Act, the National Pollution Discharge Elimination System (NPDES) program regulates stormwater discharges from both point and nonpoint sources. Managers of stormwater systems and other discharges can be required to obtain authorization to discharge stormwater according to state and federal regulations. To meet these requirements, municipalities must develop comprehensive stormwater monitoring programs.

Combined sewer overflow (CSO) episodes and stormwater runoff volumes have increased as land development has led to replacement of pervious areas with impervious urban surfaces, such as roadways and buildings. This change affects a city's watershed by impairing water quality and degrading stream habitats. Green stormwater infrastructure (GSI) contributes to alleviating the CSO problem and its effects by integrating pervious areas that manage stormwater throughout a city.

Green City, Clean Waters Plan

On June 1, 2011, the Pennsylvania Department of Environmental Protection and the PWD signed a groundbreaking agreement that allows PWD to officially implement its Green City, Clean Waters plan. PWD plans to invest $2.4 billion over the next 25 years to significantly reduce CSOs (Philadelphia Water Department, 2011). To ensure that this public investment not only results in clean and beautiful waterways, but also provides tangible, additional benefits to citizens, PWD is dedicating a large portion of this plan to a green stormwater infrastructure (GSI) approach. The estimate for installing a GSI system is approximately $1.67 billion, in addition to $345 million in wet weather treatment plant upgrades and $420 million in adaptive management.

Reducing Combined Sewer Overflows

There are two ways to manage stormwater. Traditional, or gray, infrastructure refers to pipes and tanks below ground that are used to collect and transport wastewater and stormwater to treatment plants. One way to reduce CSO is to build an additional gray infrastructure.

Another method is to build a green infrastructure. GSI incorporates natural and manmade features that allow rainwater to soak into the ground rather than flow into the stormwater systems or drain into rivers, creeks, and streams. Examples of this approach include natural methods, such as preserving vegetation, wetlands, and open space to absorb stormwater in populated areas. GSI also can involve artificial solutions, such as rain barrels and permeable pavement. Use of green infrastructure is driven by regulatory requirements, and agencies have been increasingly favorable toward the incorporation of these elements into plans for addressing sewer overflows. PWD uses GSI to manage stormwater whenever possible.

Philadelphia Water Department's Green Approach

Over the next 25 years, Philadelphia is committed to deploying the Green City, Clean Waters plan. This major green infrastructure project requires the retrofit of nearly 10,000 acres to manage runoff onsite, relies on green infrastructure for a majority of CSO reductions, calls for the investment of more public funds, and leverages substantial investments from the private sector. The city will fund its costs with a stormwater fee based on impervious area, supplemented by state and federal grants. To encourage retrofits on private properties, the city offers incentives, such as reduced stormwater fees and low-interest loans. The city also installed dozens of green infrastructure demonstration projects, published a design manual, and is developing a maintenance handbook for these GSI practices.

This long-term GSI program requires $1.67 billion in funding. It is estimated that for every dollar of investment, the city will reap more than a dollar in social, economic, and environmental benefits (Philadelphia Water Department, 2011, 17). Some of the key features of the program include the following:

- Retention standards: The city requires a one-inch infiltration standard for new development and redevelopment projects.
- Requirement to use green infrastructure: One third of the impervious surfaces that drain into the city's combined sewer system will be transformed into greened acres. Each green acre represents an acre of impervious cover within the combined sewer service area that has at least the first inch of runoff managed by stormwater infrastructure. This includes the area of the stormwater management feature itself and the area that drains to it. On average, one acre receives 1 million gallons of rainfall each year. Today, if the land is impervious, it all runs off into the sewer and places demands on the water treatment system. A greened acre will prevent 80 to 90% of this pollution and decrease the amount of water that needs to be processed (Green City, Clean Waters, 2007, 5).
- Incentives for private parties: The city offers reduced stormwater fees, green roof tax credits, rain barrel giveaways, expedited permit reviews, free design assistance, and low-interest loans to owners of large impervious properties.
- Guidance: Philadelphia has installed dozens of green infrastructure demonstration projects, has published a technical design manual, and is developing a maintenance handbook.
- Dedicated funding: The Green City, Clean Waters plan includes an investment of at least $1.67 billion in public funds directed at reducing CSO. The city's share of the costs is supplemented by state and federal grants.

These green infrastructure changes are expected to reduce the amount of polluted rainwater flowing into waterways. The result will be the creation of a green legacy for future generations that incorporates a balance between ecology, economics, and equity (Philadelphia Water Department, 2011, 17–19). In 45 years, the Green City, Clean Waters program will have generated more than a return on its investment in terms of cost efficiencies and gains in effectiveness, including the following.

- Creating jobs help to reduce the social cost of poverty. These jobs require no prior experience and are appropriate for individuals who are unemployed or living in poverty.
- Increasing the property values of homes near parks and green areas by up to $390 million. Property values near these amenities are expected to increase by 2 to 5% because of these green additions.
- Reducing the number of excessive heat fatalities by 140 over the next 45 years. The green infrastructure improvements will create shade, reduce the amount of heat absorbed by pavement and rooftops, and emit water vapor. These combined effects help to create a cooling effect for the city.
- Increasing the number of trees to help the overall air quality in the city. This will decrease the number of premature deaths, asthma attacks, and missed days of work or school.
- Reducing cooling needs by 1 trillion BTUs. This will reduce the level of carbon dioxide emissions by up to 1.5 billion pounds, the equivalent to removing 3,400 vehicles from the roadways.

Myriad Positive Outcomes

In addition to the financial benefits, other positive outcomes are associated with pursuing a green service program. Because green initiatives are highly visible, they appeal to the public, and as a result of the public's favor, political support follows. This is contrary to the kind of negative sentiment regularly heaped on the construction of large underground storage tanks and other gray infrastructure projects used to contain stormwater overflows.

Rather than viewing cities and nature as opposites, construction of GSI restores nature. This is contrary to past practices of removing hills, draining wetlands, and redirecting streams to make the urban infrastructure fit the natural. While renewing its infrastructure, PWD is planting trees, rain gardens, and other above-ground amenities that provide multiple benefits of economy, sense of place, ecology, and public health.

Other cities have been faced with up to an $8 billion cost for creating entirely new tunnels to separate stormwater from wastewater. In contrast, PWD will spend about one quarter of that over the next 25 years on green infrastructure meant to keep much of the stormwater from ever entering the system. The end result is fewer streets being torn up to install new tunnels. Also, more trees and other greenery will be planted throughout the city, providing cleaner air and water while reducing the urban "heat island" effect each summer.

By redirecting the billions of dollars it would have cost to dig up almost every street in the city and lay new pipes for stormwater, or building massive

containment units to hold the stormwater before it overflows into the rivers, or some combination of both, PWD is going to keep much of that water from ever getting into the sewer. The cost of implementing this plan is just 25% of the cost of replacing the entire system.

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Chapter 6

Public–Private Partnerships for Sustainable Economic Development

Public–Private Partnerships (also known as PPPs) have a relatively common place in public service delivery. In recent years, public administrators and nonprofit managers have added PPPs to their economic development toolkits as a means of encouraging economic development. These partnerships have emerged as quasi-governmental structures designed to both establish and implement policies outside the traditional contracting that occurs between the public and private sectors (Walzer and Jacobs, 1998; Weaver and Dennert, 1987). PPPs have enjoyed a relatively successful track record in creating a mechanism by which synergies between the two sectors are more fully realized than is possible in traditional public–private interactions (Mullin, 2002).

In very broad strokes, public private partnerships are collaborative relationships between the public and private sector wherein a public agency contracts with a private organization to provide a service or function. In more technical terms, these partnerships arise out of structured agreements between public agencies and private sector organizations to share the delivery of a service or facility for public use (National Council on Public–Private Partnerships, 2012). Their form and function, however, are governed by enabling legislation both at the state and the local level. In 2010, 29 states and Puerto Rico had legislation providing the legal framework

for transportation-related PPPs, with more than $46 billion having been invested through these arrangements (National Conference of State Legislatures, 2010).

This chapter begins with a discussion of what public–private partnerships are and provides a general overview of the types of PPPs available to localities both broadly and more specifically in terms of form and function. Then it turns to an overview of the advantages and disadvantages of PPPs as well as the practical issues surrounding partnership formation. It also presents examples of how localities leveraged these partnerships to find common ground between economic development and sustainability. The chapter closes with a case study showing the concepts of this chapter in action by reviewing the use of a PPP to pursue these two goals simultaneously in the city of Cookeville, Tennessee.

Characteristics of Public–Private Partnerships

Five characteristics distinguish infrastructure and economic development PPPs from other types of public–private agreements: ongoing relationships, value transfer, shared risk and responsibility, integration, and, finally, an emphasis on outcomes (Forrer et al., 2010; Rivenbark, 2010, 7). Economic development and infrastructure partnerships are distinctive in that they tend to be long-term arrangements outlining the roles and responsibilities of each partner for the duration of the contract. The partnerships tend to be rigid and inflexible, which can be both an advantage and a disadvantage.

One unique feature is that the relationships in PPPs are fairly integrative and comprehensive, meaning that the private sector partner selected to enter into the arrangement is generally involved in every aspect of the project. This is markedly different from other forms of public–private contracting where the private partner has a limited and narrowly defined scope of duties and the length of the engagement is much shorter.

PPPs, especially those designed for infrastructure and economic development, are distinctive because they transfer both power and authority to the private partner for the purposes of meeting project obligations (Rivenbark, 2010, 7). This transfer of authority enables the arrangements to be successful. For example, public utility or municipal easements are rights to use private property for defined purposes. In instances where those easements must be used in carrying out activities related to the partnership, the private sector partner has the authority to do so via the agreement. Thus, these partnerships are unique in that the private sector partner acquires some of the public organization's authority that it would not typically have in a strict contract-for-services agreement.

One defining difference between PPPs and traditional agreements between localities and private entities is the introduction of shared risk and responsibility. A typical transaction might include the hiring of a private corporation to build a facility or infrastructure while the public organization retains all risk and responsibility.

In contrast, PPPs distribute risk and responsibility in a more balanced way. The shared nature of a PPP also extends to potential financial benefits generated from the arrangements. Both partners must have some type of financial incentive when entering into the project. Otherwise, it would be highly unlikely that the public sector organization would find a willing private sector partner. Additionally, PPPs are characteristically comprehensive in regards to the extent to which both parties are involved in every stage of the process, from start to finish. This is a significant departure from traditional private sector contracting where outside involvement is limited to specific parts or stages of the process.

The final characteristic that distinguishes infrastructure and economic development PPPs from other forms of public–private collaborations is a focus on outcomes or performance measures. PPPs are known for their exacting performance standards and outcomes requirements. In fact, many partnerships have financial incentives or penalties governing the private partner's work.

Beyond the issue of performance monitoring, there is a strong underlying assumption that these arrangements can encourage more efficient and effective methods of construction by the private organization. In many PPPs, responsibility for maintenance and operations lies with the private entity. The idea is that the organization will use more effective methods of construction or operation because anything less would increase the costs associated with maintenance (Rivenbark, 2010, 8).

Types of Public–Private Partnerships

Degree of Shared Risk and Responsibility

PPPs can be categorized by the degree to which the activities, risks, and responsibilities of a previously public service provision are shared with or transferred to a private entity (Corrigan et al., 2005). Through this method of classification, three overarching models of PPPs emerge:

1. Operation, maintenance, and service contracts
2. Construction, operation, and investment projects
3. Joint ventures (Koppenjan and Enserink, 2009)

In this first variation, the public partner transfers the responsibility of operating and maintaining a public facility or infrastructure to a private partner for a set cost. Thus, any financing needed for the project, including new construction or capital investments, is taken on by the public sector organization. In this scenario, the private partner takes over the management of the facility and agrees to meet specific performance requirements and minimum operating standards. This type of PPP is very common in the corrections industry.

The second model of public–private collaboration leverages private financing, wherein the private partner funds the construction of the facility or infrastructure and oversees its operations and maintenance until it has recouped costs. Then the private partner transfers ownership to the public organization. The final broad model of PPPs is joint ventures. These are partnerships where both parties share in the financing or contribute to the capital costs associated with the project.

Twelve Models of Public–Private Partnerships

A wide range of PPPs span the continuum of three types described above. Because the intent of this book is to provide practitioners with concrete examples and practical information, it is worth moving beyond the general to the more specific. Accordingly, there are 12 specific types of PPPs that a locality may use in the pursuit of economic development and sustainability. These 12 types can be divided into three specific categories: building agreements, contract agreements, and leasing agreements. Each of these specific types is discussed in further detail in the following sections (U.S. Government Accountability Office, 1999).

Building Agreements

Build–own–operate is the first type of partnership in which the private organization constructs and operates the facility or infrastructure without the intent of transferring ownership to the public partner. This approach may improve effectiveness of the private partner's construction methods and efficiency of its operations because there is an incentive for the partner to do so, as the company is responsible for both under this arrangement (Engel, Fischer, and Galetovic, 2011). Alternatively, in the build–own–transfer arrangement, the same process occurs, but there is an understanding that the public sector organization will take ownership after some period of time. The agreement is generally structured to be long enough for the private sector partner to recoup the costs of building and operating the facility and possibly earn a return on investment.

Buy–build–operate works much in the same way, but in this iteration, an existing public building or facility is purchased and expanded or rehabilitated. Turnkey partnerships are a variant of the build–own–operate approach where the public organization contracts with a private organization to build a facility or infrastructure for a set price and clear performance standards. In this way, the risk of increasing costs or other unforeseeable events is taken on by the private entity (Hardcastle and Boothroyd, 2003). Moreover, by partnering with a private organization in this manner, the public sector organization can bypass procurement and financing regulations that typically govern the process in the public sector.

Contract Agreements

Contract services are another form of PPP and can be further classified into two types. Operations and maintenance creates a relationship where the private organization is contracted to operate and provide maintenance for the facility or infrastructure, with the public organization retaining management responsibilities. Alternatively, operations–maintenance–management partnerships transfer responsibility to the private partner for everything relating to the facility except ownership. The private partner may invest in the facility, but doing so will need to be recouped within the financial benefits outlined in the contract and does not grant any rights of ownership. Local governments generally use this latter form to enter into partnerships to provide wastewater treatment services (U.S. Government Accountability Office, 1999, 5).

Design–build–operate PPPs are intended to create a single contract for the design, construction, and operation of a facility or infrastructure. Generally, ownership remains with the public organization, unless it becomes a design–build–operate–transfer project. This is different from the traditional "separated and sequential" approach wherein a public organization would have to create separate contracts with architects, engineers, builders, owners, and operators (U.S. Government Accountability Office, 1999, 5).

Developer financing provides a mechanism for entering into a partnership where the private organization finances the public project in exchange for rights related to development or occupancy in or around the proposed facility or infrastructure. The developer has the ability to generate revenue through either sale or lease of the structure it builds, even as the facility or infrastructure is occupied by the public sector partner. However, it is unusual for developers to build under this arrangement. They are more likely to enter into a leasing agreement for an existing facility, which allows the public entity to expand or enhance the facility through private sector financing (U.S. Government Accountability Office, 1999, 6).

Leasing Agreements

A common set of PPPs involves a variety of leasing arrangements. The first, lease–develop–operate or build–develop–operate, allows the private organization to lease or buy an existing facility or infrastructure to improve or enhance it. The facility then is operated under contract with the public sector organization. A lease–purchase partnership secures a private sector organization to construct and finance a building or infrastructure. Upon completion, the public sector organization moves in and makes payments to the private sector partner. Once the facility has been paid for or the term of the contract has ended, the public sector organization takes possession if the structure has been paid in full, or it pays a predetermined lump sum to purchase the facility.

Another iteration on the use of leases includes the sale–leaseback agreement, wherein the public sector partner sells the facility or infrastructure to a private

sector organization and then leases it back from the new owner. Local governments and organizations have used this approach in an attempt to limit their liability under certain laws and regulations (U.S. Government Accountability Office, 1999). An enhanced-use leasing partnership is similar to other lease agreements, but instead of allowing the private organization the freedom to choose the way it uses its portion of the facility or infrastructure, the use must be in keeping with the organization's purpose or mission.

Advantages, Disadvantages, and Common Pitfalls

This discussion of types of PPPs is not prescriptive or exhaustive. The needs and requirements of a project will dictate which of these models is most appropriate for a particular project. However, before entering into one of these arrangements, it is important to fully examine the advantages and disadvantages of each type of partnership. That way, an organization deciding to enter into a PPP can structure an agreement that seeks out the advantages, avoids the disadvantages, and escapes the common pitfalls.

While the potential for economic development is a welcome scenario for any locality, it goes without saying that the pros and cons of any arrangement should be carefully considered before entering into a long-term agreement. Moreover, it is essential to review the lessons of other PPPs and understand where they were unsuccessful. A PPP that is based on a firm understanding of the disadvantages and pitfalls is likely to generate the outcomes that were expected from the beginning.

Advantages and disadvantages can be spoken of only in general terms because each partnership is unique and comes with its own challenges and obstacles (International Institute for Sustainable Development, 2012, 5). However, some commonalities exist among all partnerships.

Advantages of PPPs

At the heart of many PPPs is the value proposition (Morallos and Amekudzi, 2008). Communities enter into these arrangements to pursue public objectives in ways that are faster, more economical, safer, and more effective by seeking out synergies between the public and private sectors (National Institutes of Health, 2012). In many instances, these partnerships are designed to lower overall costs for the public partner, which directly translates into a freeing of resources that can be used for economic development purposes.. In most cases, because they bypass traditional procurement processes, PPPs can generate faster results. These partnerships also may provide public sector organizations the ability to take on more than one project, or more projects than they would have been able to, had they not entered into the partnership. This occurs because these partnerships can reduce the amount of funding needed for projects (International Institute of Sustainable Development, 2012, 5).

Another advantage of a PPP is increased focus on outcomes and performance-based management. Because these agreements commit the private partners to specific outcomes, this aspect is sometimes referred to as the key feature of risk transfer from public to private entity (Bloomfield, 2006). This can be best understood within the context of the decision-making process that the private entity goes through when choosing methods of construction, maintenance, and operation (Grimsey and Lewis, 2004). For example, when private partners are responsible for the design, construction, and maintenance of a facility or infrastructure, they are more likely to choose more effective methods because they are responsible for the costs of any deficiencies or inefficiencies. This is unlike traditional projects, where private sector contractors are awarded only a particular piece of an overall project, and, thus, their interests are limited. The eventual impacts of their decisions do not affect them. Instead, the public sector organization is responsible for the costs associated with correcting deficiencies or inefficiencies. Because PPPs limit the number of independent actors in a particular project, there are clear lines of responsibility, risk, and reward.

Beyond the issue of construction, performance measures are necessary in other areas. For instance, when private sector partners are engaged in the operation and maintenance of a facility or infrastructure, there should be key performance indicators that allow the public sector organization to track and assess the extent to which goals and targets are being met. In fact, some partnerships negotiate payments to performance targets, which provide additional incentives for complying with goals and objectives. When identifying performance measures, it is best to ensure alignment between overall agency goals and the indicators (U.S. Department of Transportation, 2011, 2). By doing so, public sector organizations can ensure that the project and its outcomes are consistent with their mission and purpose.

As discussed earlier, the transfer of risk from the public sector to the private partner is a significant and attractive advantage when considering the use of PPPs. The private sector partner becomes interested in the long-term outcomes of its own performance and methods, and, thus, the risk becomes either shared or entirely transferred between the two (Sarmento, 2001, 4). Therefore, risk transfer can introduce stability into the project that is generally not present when public sector organizations engage in these endeavors alone. This stability is found in the protection of the public sector organization from surpassing financial or time estimates (Siemiatycki and Friedman, 2012, 2).

Disadvantages of PPPs

Despite there being significant and important advantages to entering into a PPP, disadvantages also should be taken into consideration. Again, it is worth noting that, like the advantages, the disadvantages do not apply to all projects, but they provide guidance on where to look for potential obstacles. One serious disadvantage is the potential for higher costs. Borrowing rates for the private sector are generally higher than those offered to public sector organizations (Shaoul, Stafford,

and Stapleton, 2007; Siemiatycki, 2007; Siemiatycki and Friedman, 2012). This issue can be negated if the public sector organization structures the arrangement so that it provides the financing, or by use of some other mechanism that allows the private entity to tap into lower borrowing rates. Similarly, because these partnerships are structured in such a way that the private partner earns a return on their investment, they may result in higher costs for the consumer than if the service had been provided by a governmental agency.

Additionally, there are the costs associated with the legal and accounting services needed when establishing a PPP. These costs can negate any of the savings associated with these arrangements (International Institute for Sustainable Development, 2012, 6). In the same vein, the number of private organizations that are able to engage in such a highly structured, complex, and capital intensive contract is limited, thereby reducing the amount of competition. Outside the costs of the negotiations and expertise needed to form these partnerships, the efficiencies gained in time may be lost if this initial part of the process becomes lengthy. The formation phase also requires a significant amount of expertise and capacity on the part of the public and private sector partners. Because time and expertise are generally lacking in both, external experts are brought in to structure and negotiate the partnership, which may increase the overall cost of the operation (Deloitte Research, 2007, 13; Jooste and Scott, 2012).

PPPs introduce stability into public works projects that have been infamously unpredictable, but there is another side to PPPs that should be evaluated carefully—the long-term nature of these contracts. Given the exacting performance requirements and specifications that public sector organizations set for the private partner, these same requirements can create a contract that is inflexible or rigid even for the public partner. The resulting situation may be one where, without the benefit of foresight, the public organization commits to a project that fails to meet future needs or financial situations.

Common Pitfalls of PPPs

Despite a growing body of literature, both academic and applied, outlining the methods and means of constructing successful agreements, localities still find themselves falling into some common traps when it comes to navigating PPPs (Deloitte Research, 2007, 13). Even though PPPs focus on performance measures and outcomes, a lack of clarity or agreement on project objectives is the first common pitfall. When this occurs, agreements tend to focus on inputs over outcomes, or, in some cases, where they can move beyond inputs, they rely on outputs.

There are significant differences between inputs, outputs, and outcomes. Inputs are the investments that go into the project, outputs are the results of those investments, and outcomes are the impact on the original purpose and objectives of the partnership (Leuenberger and Bartle, 2009, 12). Even though it may take time and work, it is essential that the goals and objectives of the project be broken into

measures that indicate inputs, outputs, and outcomes. Then the organizations must build a strong set of performance measures that ensure the private sector partner has the information necessary to perform as intended.

Another area where PPPs go wrong is in the structure of the arrangements. Deloitte Research (2007, 13) points out that the success or failure of these partnerships is directly related to the policies, legislation, and guidance that govern their use. Many times, the regulatory environment (or lack thereof) in which these collaborations are formed contributes to a situation where the deal becomes laden with expectations and requirements. This may disproportionately transfer risk to the private sector partner so much so that a deal cannot be reached. Similarly, the focus can become too narrow, and the partnerships can be arranged as financial transactions instead of as the more comprehensive agreements they are intended to be. In fact, the less comprehensive these arrangements are, the fewer benefits localities are able to reap from them.

Many types of PPPs exist, and many localities have missed the mark by selecting the wrong model for the project. Thus, the planning part of the process should include a significant and thorough examination of the goals and objectives of the project, leading to an analysis of which model is best suited to achieve these outcomes. In many ways, pitfalls are related to poor planning and a lack of information necessary to perform robust analyses of costs, benefits, and risks. It is essential that localities put the necessary effort into the initial phases of the process, rather than leaping into an opportunity that appears to be a long-awaited solution.

Another common issue in infrastructure and transportation partnerships is the issue of risk transfer. For instance, urban rapid transit PPPs have regularly experienced lower than projected ridership numbers. When that risk was transferred to the private partner, it has resulted in terminations of the partnerships (Menzies and Mandri-Perrot, 2010, 2). This is especially problematic when one considers that the private sector partner has little, if any, control over generating demand or integrating the project into the larger transportation network, which will affect ridership numbers (Siemiatycki and Friedman, 2012). Thus, to mitigate the risk of a failed partnership, it is necessary to structure agreements that transfer risk to the party that can directly affect or influence outcomes related to that risk. Alternatively, when neither party has control over demand, it may be necessary to share in that risk versus making a complete transfer.

Practical Issues in PPP Formation

Now that the basic types of PPPs have been discussed, including an overview of the advantages, disadvantages, and common pitfalls, the next step is to outline practical issues surrounding the formation of these arrangements. This discussion is not meant to be a step-by-step guide of how to design a partnership; instead, it serves as a list of key areas or questions that must be addressed as localities move from

discussing the idea of partnership to the next stage, which is the formation of the partnership. Three basic steps must be addressed when forming a PPP: (1) understanding the regulatory environment in which the partnership will be formed; (2) defining the project needs, goals, and objectives; and (3) determining responsibility for each stage and part of the project (Deloitte Research, 2010; Norment, 2012).

Understanding the Regulatory Environment

Understanding the regulatory environment for PPPs in both the state and the locality is important, because many times state legislation and municipal ordinances either facilitate or prohibit their formation (Pikiel and Plata, 2008). The legal structure provides "a stable and efficient regulatory framework to make the economic and legal environment the most predictable possible, and reduce the risk of changes of the rules of the game" (Pacific Economic Cooperation Council, 2006, 17).

In the United States, enabling legislation at the state level for PPPs varies across a number of factors (Istrate and Puentes, 2011, 12). The first and most important feature of these laws is the extent to which they specify the types of projects that can be pursued with a PPP. Twenty-two states have broad, enabling laws allowing public organizations to pursue partnerships outside the bounds of transportation and infrastructure. The remaining states limit PPPs to road projects only (Istrate and Puentes, 2011).

Some states allow agencies and localities to accept unsolicited proposals, while others do not. The need for transparency and accountability is one reason for not accepting unsolicited bids. Solicitations typically have well-defined objectives, have guidelines for performance measures, and are grounded in policy objectives that pursue the public interest. Bids accepted from a formal solicitation process are more likely to address the requirements set out by the public agency, as compared with proposals prepared without such guidelines. Regarding transparency, requests for proposals are matters of public record and provide the public with notice that a locality or public organization is considering entering into a PPP. Unsolicited proposals may not allow for the same type of transparency that occurs during a traditional solicitation process.

Enabling legislation variably outlines the type of financial arrangements relating to the transfer of funds or payments to a private partner from the public sector organization. These laws are extremely important, considering that many partnerships are predicated on certain types of financial instruments. In some states, lower-level agencies are permitted to enter into these partnerships, and some require the state legislature's approval for doing so. Legislation in a number of states allows or prohibits the inclusion of language regarding competition by the public sector in future projects that may compete with an existing PPP project. And, lastly, 14 states permit public sector organizations to bring in outside consultants to assist with technical and legal issues relating to the projects (Istrate and Puentes, 2011, 13).

Defining Project Goals and Meeting the Public Interest

In terms of defining the project needs, goals, and objectives, it should first and foremost be the case that the proposed project is entered in the public interest. As a matter of practice that interest should be translated into a set of public policy objectives for the project, including in the following categories (California Debt and Investment Advisory Commission, 2008, 5):

- Economically, effectively, and efficiently providing a service to the public
- Using every method and asset to its fullest potential in pursuit of serving the public
- Ensuring that both public and private sector participants benefit by an appropriate allocation of risk and return.

Beyond ensuring that the proposed PPP is serving the public interest in its objectives, it is essential that the project leaders seek out public participation in the decision-making process around entering into the agreement. This is especially important when one considers the project risks and, in some cases, transfer of the management of a public service provision. Moreover, when the PPP is arranged in such a way that user fees will be part of the equation where there once was none, it is necessary to ensure that the public supports such a proposition.

Given these risks, it is worth asking if the public servants charged with overseeing the PPP and ensuring that public interest is being met have the capacity to do so (Corrigan et al., 2005, 3). For those without the capacity or those searching for methods of involving the public, the International Association for Public Participation provides a spectrum representing varying levels of public participation (Figure 6.1). The spectrum classifies the levels into five categories that are grouped by the primary purpose of involving the public and the promise that can be communicated to them as a result of that level of participation.

The participation spectrum also provides a list of techniques to consider based on the level of participation desired or even required. The levels include inform, consult, involve, collaborate, and empower. The level of public participation desired is an especially important question. For something as significant as altering the traditional provision of public services by transferring responsibilities to or sharing responsibilities with a private partner, consultation is likely the lowest level of involvement a locality should consider when seeking public participation in the deliberation process.

Determining Responsibility

The last item to research when forming a PPP is how responsibility will be divided for each part of the project. Without identifying which actor will be responsible for specific pieces of the project, it is impossible to determine if the appropriate partner

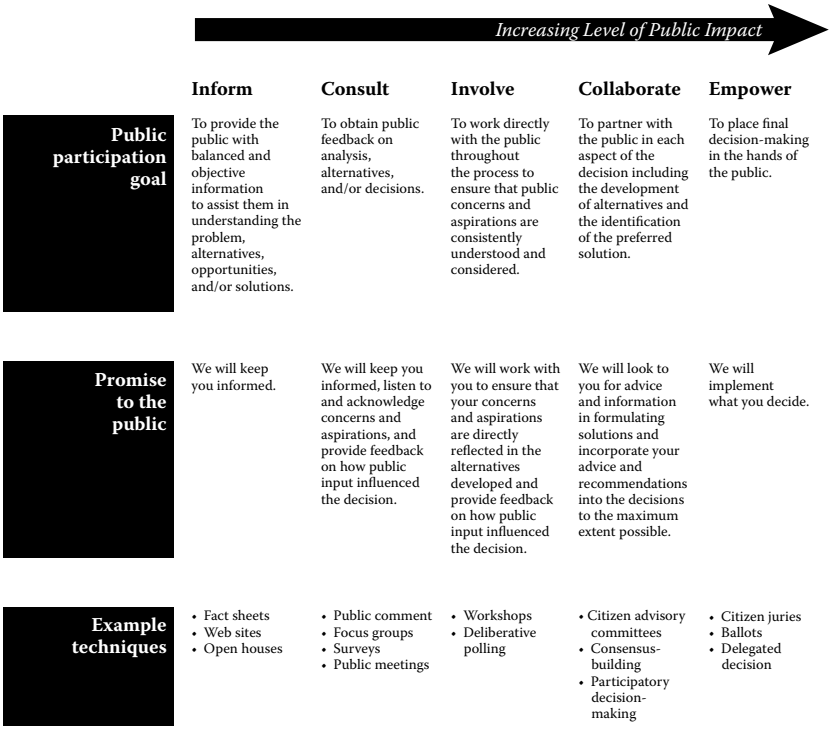

Figure 6.1 Public participation spectrum. (From the International Association for Public Participation (IAP[2]), Thornton, CO. With permission.)

is accountable for a particular activity; determine the level of risk and who is responsible for assuming it; or hold partners accountable for failures in performance.

Although transferring responsibilities to a private partner will free up some capacity in the public sector, it also creates the need for public sector employees to take on new tasks (Jooste and Scott, 2012, 150). The public sector partner must have enough staff resources to monitor the private partner's activities, address feedback from users of the service, and determine whether the private partner is meeting the goals outlined in the agreement (Rivenbark, 2010). The public organization needs to define which internal resources can create and negotiate the agreement, manage the transition of responsibility, and evaluate the program based on defined performance goals (Moulton and Wise, 2010, 351). It is also essential to identify an "energetic executive" who has both the right skills and personality and the authority needed to manage the project (Moulton and Wise, 2010, 351).

A strong accountability system is required, and it should be established during the formation phase of the process. Accountability in PPPs requires the creation of proper safeguards to ensure that public services are not compromised for the sake of private profits (Forrer et al., 2010, 477). In fact, designing strong accountability

measures up front can lead to a better understanding of the needs of the project, which can assist in choosing the right partnership model (Chase, 2009).

In the end, even the best performance measures are ineffective unless individuals responsible for using them are trained in how to leverage the information to make informed decisions. The partnership must be structured so that failure to meet goals results in corrective action designed to encourage improvement (Garvin et al., 2011).

Sustainability and Public–Private Partnerships

Three types of global PPPs have emerged: business ventures, double bottom line ventures, and social ventures (Kaul, 2006, 223). Business ventures are specifically related to financial rewards and gains. Double bottom line ventures seek both financial returns and improvements in an important issue such as environmental protection. Social ventures are less focused on financial gains and instead seek improvement in a public issue. Within this framework, this section presents examples of PPPs that are double bottom line ventures, where the goals are both financial gain and improvement in the environment, or pursuit of a more sustainable service provision.

Wastewater Treatment in Santa Paula, California

A particularly illustrative example of a double bottom line project is the Santa Paula Water Recycling Facility PPP. The City of Santa Paula, California, had a wastewater treatment facility that was built in 1939 and required replacement. Among other things, the facility was discharging effluent that was unable to be reused (PERC Water, 2012). The city faced more than $8 million in compliance fines from the state and was having difficulty securing financing for the improvement project.

Initially, the city pursued a design–bid–build approach, but it sought another alternative once stakeholders understood that that particular model would not meet compliance deadlines or fit their budget. The city instead chose a design–build–operate–finance model in an effort to secure a partner to take control of the project from start to finish, including its operation after construction. The city received a bid from PERC Water that included 30% of the design process finished in advance. Thus, PERC Water was already ahead of schedule before being awarded the project.

In 2008, PERC Water was awarded a 30-year contract that set out specific performance requirements, including expansion of the facility's capacity by 23% at no additional capital cost to the city. In addition, PERC Water assumed all of the risk related to fluctuations in interest rates and financing terms. The company also agreed to transfer ownership back to the facility after 30 years at no cost to the city.

This agreement increased the sustainability of the wastewater treatment facility, including by adding the capacity to reuse the treated water, which was not possible with the previous system. The PPP resulted in 90% of the hours worked

on the project being done by local labor and $4.5 million being invested in the local economy, not including sales tax revenue (WaterOnline, 2011). The PPP won Global Water Awards' 2009 "Water Deal of the Year" award of distinction "for their contribution to the advancement of PPPs in the international water sector specific to their contract to design, build, operate, and finance the Santa Paula Water Recycling Facility" (PERC Water, 2012, 7).

Heating and Cooling Improvement in Nashville, Tennessee

The metropolitan government of Nashville, Tennessee, had an existing heating and cooling system that served "approximately 40 buildings in downtown Nashville, including the state capitol and other government buildings, the NFL's Tennessee Titans, the Gaylord Entertainment Center, home of the NHL's Nashville Predators, and a number of privately owned office buildings and hotels" (National Council on Public–Private Partnerships, 2012). The facility was regularly failing to meet both economic and environmental goals.

In response to a request for proposals by the City of Nashville, Constellation Energy Projects & Services Group (CEPS) submitted a bid to design, develop, and operate a new $46-million heating and cooling facility while maintaining the existing facility until operations could be transferred. The project was completed seven months ahead of schedule and was funded by municipal bonds. The City of Nashville retains ownership, and CEPS has a 15-year agreement to operate and maintain the new facility.

The facility switched from a trash-burning operation to one that relies on natural gas, which significantly decreased the facility's overall impact on the environment. The facility implemented new technology and achieved efficiencies the older facility was unable to realize. The project is on track to save the City of Nashville nearly $70 million and reduce heating and cooling costs for all of the buildings served. Moreover, the PPP was able to identify an alternative location for the new facility, away from the existing site along the riverfront. The riverfront will now become a site for a number of economic development opportunities.

Conclusions and Concepts in Action: Cookeville, Tennessee

These examples demonstrate that it is possible to pursue economic development and sustainability simultaneously through public–private partnerships. These need not be mutually exclusive goals, and given that performance indicators are part of any PPP, it is up to the public sector to identify and incorporate sustainability measures as part of the agreement (Koppenjan and Enserink, 2009). PPPs are models of

how sustainability can be achieved through cross-sector collaboration (Ferroni and Castle, 2011, 1065; Malmborg, 2003).

This chapter provides a framework from which to set an agenda for starting the conversation on whether PPPs are right for your locality or project. The reality is that no two PPPs are alike. The technical and legal capacity needed to form them is enormous, and a how-to manual covering every possible variation would be prohibitively long. However, armed with the information presented here, localities can be aware of the advantages, disadvantages, and common pitfalls encountered when pursuing these arrangements. Moreover, the chapter provides examples of how PPPs have been used to pursue economic development and sustainability objectives simultaneously.

The following case study outlines how the city of Cookeville, Tennessee, also leveraged a PPP to pursue both of these objectives. While the example that follows does not fit perfectly with one of the types of public–private partnerships discussed above, this is only the case because the private partner in question provided the service free of charge. As will be discussed next, the city in question was without the needed technical expertise or staff to monitor its energy usage, which would have allowed it to realize cost savings through the reduction of its utility costs. In the absence of the needed manpower, the city entered into a partnership with a private organization to provide the necessary training and leadership to assess its energy conservation practices and to make changes that would result both in cost savings and benefits to the environment. Despite its uniqueness, the case study that follows is a classic example of a public and private sector engaging in a collaborative relationship to find the common ground between economic development and sustainability.

CUMMINS FILTRATION AND COOKEVILLE'S UNPLUGGED CHALLENGE

The City of Cookeville, Tennessee, is a community of roughly 30,000 and is located between Nashville and Knoxville (U.S. Census Bureau, 2012). The largest of 20 micropolitan areas in Tennessee, Cookeville operates under a council–manager form of government and operates its own municipal utility. The partnership that developed between the city and Cummins Filtration is an example of an unsolicited partnership that resulted in a knowledge transfer between a private and public entity. The result of the partnership not only allowed for financial savings for the city, but also presented the opportunity to discuss environmental issues within the broader community. The benefits received from this partnership far outweigh the costs required from each partner. As will be discussed, the partnership represents how an environmental public–private partnership can be framed from a cost-savings or

economic development perspective while still addressing environmental issues in communities that may be skeptical or unenthusiastic about environmental initiatives.

Connecting Cummins Filtration to the City of Cookeville

Cummins Filtration is a global manufacturing and distribution company of filtration, coolant, and fuel additives for commercial engine systems. Their corporate headquarters are located in Nashville, Tennessee, with 23 production plants and 16 distribution centers around the globe.

The partnership between Cummins Filtration and the City of Cookeville might not have occurred had it not been for the Cookeville Area–Putnam County Chamber of Commerce. The Chamber of Commerce has an Existing Industry Committee comprised of individuals, such as chamber board members and a cross section of local industry representatives. Members of the committee routinely contact industries in the area to assess how they are performing and to see if they may need support or assistance.

One of these routine calls in 2010 results in the Chamber of Commerce connecting Cummins Filtration with Cookeville city leaders. During the site visit, the plant manager of the Cookeville Cummins Filtration production plant indicated a desire on the part of Cummins Filtration to help support the community by adapting the company's Unplugged Challenge to fit the needs and characteristics of the city.

Cummins Filtration's Unplugged Challenge is one of several programs implemented to engage employees in the company's initiative to improve the environment and address climate change. Implemented in late 2008, the program challenges facilities to reduce energy waste through a combination of system power-downs and employee conservation steps. A site employee—called a Facility Leader or Energy Champion under the program—is responsible for developing a shut-down plan and executing the strategy with fellow employees. Each year, the best-performing sites receive recognition for their performance. For the 2010–2011 challenge year, the Cookeville site won the Best Cost Reduction award (savings of $39,755) and the Best Greenhouse Gas Reduction award (419 carbon dioxide equivalent abated) (Cummins Filtration, 2011).

Considering the success of the Unplugged Challenge program and the offer from the local Cummins Filtration site, the Chamber of Commerce acted as a broker connecting the Cummins facility with city leaders. Lillian Hartgrove, vice president of Economic Development for the Cookeville Area–Putnam County Chamber of Commerce, contacted Melinda Keifer, the Economic and Community Development coordinator for Cookeville, after

the chamber's visit to the local Cummins Filtration site. Prior to the contact, the City of Cookeville was not actively pursuing environmentally sustainable policies, but leaders understood the possible complications in bringing a program like the Unplugged Challenge to the community. Thus, instead of focusing on the environmental benefits of the program, the Unplugged Challenge program was primarily promoted from an economic development perspective.

Energy sources in this area of Tennessee are primarily coal and hydroelectricity provided by the Tennessee Valley Authority (TVA). The City of Cookeville budgeted at least $1.8 million annually for electricity, with monthly costs for power, sewer, water, and heat for city operations running between $90,000 and $95,000 (Melinda Keifer, personal communication, November 2, 2011). Considering the decline in the economy, the Unplugged Challenge program was pitched as a way to save the city money, with the added benefit of being environmentally conscious.

As outlined in a white paper presented to the city manager on September 20, 2010 (Hoegeman, 2010), adapting the Unplugged Challenge model is a way for the city to use less energy as well as to save money, by implementing a number of conservation steps and power-down actions. The partnership provided the city with the benefit of reducing of energy costs and greenhouse gas emissions. Costs associated with the program were man-hours for training staff and the use of facilities for training. Cummins Filtration helped the city to adopt the Unplugged Challenge to fit the needs of Cookeville operations by providing training and other resources.

Cookeville's Unplugged Challenge

Cookeville's Unplugged Challenge was based on the goal that all departments and facilities would implement power-downs and low-cost, low-tech conservation steps during shutdown periods (e.g., holidays and weekends) to reduce energy consumption and greenhouse gas emissions. Planning and engagement from several key groups within the city, such as leadership, facility staff, and operation leaders, was required. To accomplish this, four tasks were identified: train Energy Champions, develop department energy hunts, provide training resources and materials, and develop a three- to five-year plan to expand the program beyond the City of Cookeville facilities (Hoegeman, 2010). Each of these tasks was a service provided by Cummins Filtration as part of the PPP.

The first task, to identify Energy Champions, involved choosing one or two individuals from the city to oversee and coordinate the program. The task also included identification of at least one individual from each city's 22 facilities,

including a gym and police station, to become Energy Leaders. Energy Leaders, a central component to the program, were trained on energy efficiency and sustainability measures in order for them to lead energy efficiency and power-down projects within their departments. Benefits of Energy Leader participation included personal benefits, such as how to conserve energy and reduce costs at home, an Energy Leader shirt, free lunch during training, and a tool that measures the energy consumption of appliances at home.

The 10-week training program, which was altered for government needs, required a commitment of one hour per week. Each week Energy Leaders were trained on an energy topic and given a set of action items designed to affect city operations (Table 6.1). During the course of the program, each participant took inventory of all electric items in his or her facility and their costs, completed homework assignments, participated in energy hunts, and identified additional no-cost or low-cost items in their departments that could improve energy efficiency. Upon completion of the training program, participants graduated as certified Energy Leaders and began working on energy-efficiency projects for their departments.

Table 6.1 Energy Leader Training

Week	*Topic*	*Objectives*
1	Kickoff	Orientation, goals, and benefits
2	Energy and the environment	GHG impact, Energy Leader role
3	Energy basics	What is energy? Costs of energy
4	Power management	GHG calculator, make energy visible
5	Machinery and equipment	Know biggest energy use in area and estimate costs
6	Lighting	Types of lighting, operating costs
7	Building envelope	Understanding impacts of building envelope
8	Heating and cooling	Awareness of HVAC, effective fan use
9	Fuel use and energy recovery	Identify heat recovery opportunities
10	Improving operations	Conduct treasure and air hunts

Source: City of Cookeville. 2010. City of Cookeville and Cummins Filtration Energy Efficiency Partnership presentation for City Council.

Implementation and Results

The Unplugged Challenge partnership entered the planning phase in September 2010, and implementation of the program began in January 2011. In November 2010, Energy Leaders inventoried electrical items and determined baseline costs for facilities. Using this information, the city created an unplugged communication plan to execute over the December holidays. In total, the city saved $750 during the December Unplugged Challenge (over a four-day holiday period) by simply shutting off lights, computers, and other noncritical appliances that would have remained on during unoccupied times (Melinda Keifer, personal communication, November 2, 2011).

Other early outcomes of the partnership included cost savings for turning off lights that had previously been left on. For example, the Water Department can save $4,000 a year by turning off six 400-watt bulb fixtures located in the basement water-testing facility that were previously left on year-round. Similarly, the Electric Department can save $700 a year by turning off lights in two truck bays that were previously left on constantly.

In January 2011, 22 Energy Leaders began official training, and completed the program in April. As part of the program, Energy Leaders inventoried and calculated the cost of 2,700 ceiling fixtures, 226 computers, 170 heaters and fans, and 71 refrigerators, in addition to a multitude of other appliances, such as personal radios and aquariums (Melinda Keifer, personal communication, November 2, 2011). Based on these findings and drawing from training, Energy Leaders made recommendations for improving energy efficiency (such as using compact fluorescent bulbs or motion sensor lights). Each leader oversaw implementation of the program objectives in his or her department or facility. As a result, a number of energy-saving projects have been implemented since the partnership began (Table 6.2).

Since graduating the first class of Energy Leaders, Cookeville's Unplugged Challenge has offered energy-efficiency training for all city employees, encouraged participation in Earth Hour and Earth Day, challenged employees to participate in the Online Energy Audit, and have begun to seek additional Energy Leaders to train. In addition, the Unplugged Challenge is now being expanded into the community. Tennessee Tech University is adopting a similar program.

Challenges and Lessons Learned

One of the foremost challenges was the framing of the Unplugged Challenge partnership. Whereas Cummins Filtration could promote the Unplugged Challenge under the umbrella of its environmental policies, the City of Cookeville did not have existing policies or support to implement an

Table 6.2 Unplugged Challenge Projects

Department/Facility	*Project Details*	*Savings*
Municipal parking lots (LED grant)	Received a $100,000 grant to change lighting in municipal parking lots. A total of 121 lights were replaced with LED fixtures	$7,790 annual 80,000 kWh
Water plant	Turned off 16 kW of lighting and three 45-gallon water heaters	$14,000 and $1,500 annually
Leisure service's Rec center	Turned off 22.5 kW of gym lighting for 17 hours a day and installed motion sensors in the restrooms and storage	$2,500 and $150 annually
Electric Department	Replaced 30 250 whps and 7 100 whps with LEDs	$3,245 annually

whps = watt high-pressure sodium lightbulbs.

Source: Karen Brown, Personal communication, January 10, 2012.

environmental program. For many governments in the southeastern United States, environmental initiatives are met with little enthusiasm and even some skepticism. As a result, environmental policy in the southeast has generally lagged behind other regions in the United States (Breaux et al., 2010; Klyza and Sousa, 2008, 23; Emison and Morris, 2010).

Given this dynamic, city leaders presented the program primarily for its economic benefits, with the environmental framework prioritized second. Under this approach, the Unplugged Challenge laid the groundwork that could later be used to generate grassroots support for future environmental initiatives. The partnership was successful in dispelling many misconceptions about environmental policy. It created a sense of awareness that the average individual could implement simple procedures, at no- to low-cost, to save money while still addressing environmental concerns.

A second challenge in implementing the program was identifying and tracking key data to measure progress—a predicament that is not unique to this case. In part, this challenge is a result of the city having quickly entered the partnership without clear goals and expectations (Melinda Keifer, personal communication, November 2, 2011). This led to delayed collection of some key data needed for tracking progress. However, this challenge has not inhibited the success of the program or led to greenwashing (situations where organizations appear or claim to be more environmentally friendly than the

organization actually is). The city has demonstrated significant and measurable energy and cost savings during the time period data have been collected, which was the primary purpose of the Unplugged Challenge.

Although specific target goals were not outlined, the program operates with general goals in mind. Foremost, city officials want to continue perfecting the program by implementing all possible low- to no-cost activities that can increase energy efficiency. The city will improve energy efficiency by developing an energy-efficiency policy manual, which will establish purchasing and operational requirements, such as purchasing compact fluorescent light bulbs (Melinda Keifer, personal communication, February 2, 2012). Once the program is perfected internally, an eventual goal is to take the program out into the community by replicating it elsewhere through training or other educational mechanisms.

Lessons Learned

The Unplugged Challenge partnership represents only one type of public–private partnership. Yet, it represents a number of common challenges and advantages associated with public–private partnerships. Framing of the program for local conditions and tracking data to measure success were two key challenges. These challenges may have been exacerbated by how quickly the parties entered into the partnership. However, despite the challenges, the partnership has allowed the city to learn and benefit from practices developed in the private sector. Implementing low- to no-cost energy saving mechanisms not only led to initial financial savings for the city, but also presents the opportunity to seek larger-scale cost-saving projects and allows for a broader discussion of environmental concerns in the community. In essence, the benefits of this partnership far outweighed the costs involved for each party. While not all public–private partnerships may be the same type partnership or follow the same path as the Unplugged Challenge, this case demonstrates how public and private entities may engage to improve community conditions that may not be achievable through other interactions or efforts.

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Chapter 7

University–Community Partnerships for Sustainable Economic Development

In recent years, population changes, industry changes, an economic recession, and reduced government spending have plagued communities. These problems can best be solved at the local level, but some communities do not have adequate resources to do so (Checkoway, 1997, 308). Many of these communities with fewer resources face a capacity deficit in terms of expertise, knowledge, and manpower because they have had to reduce personnel and cut funding for training and development. Responses to these decreases in resources and the issue of capacity have varied. It is not uncommon to find communities choosing to supplement these shortcomings by hiring private sector consultants.

As mentioned several times in other chapters, universities and colleges can prove to be great resources for local governments. Collaboration with colleges and universities to address the capacity deficit and to find new ways of leveraging resources to solve community problems is a worthwhile endeavor. Community leaders, residents, and universities themselves sometimes forget that institutions of higher education are part of the community economically, culturally, and intellectually. These institutions can affect community life in many ways (Gilderbloom and Mullins, 2005, 5). A university can further its mission by redirecting brainpower and allowing use of facilities to aid community interests (Rodin, 2007, 3). In fact, higher

education's earliest traditions were to apply faculty expertise to solving community problems (Harkavay and Wiewel, 1995; Stephens, Hernandez, and Boyle, 2009).

Thus, this chapter has two purposes. The first is to remind public administrators and nonprofit managers—should they find themselves fortunate enough to have a college or university in or near their community—to seek ways to form partnerships that result in benefits for both parties. The second is to demonstrate that colleges and universities, given the range of disciplines represented, are uniquely situated to help communities find the common ground between economic development and sustainability.

This chapter provides an overview of university–community partnerships, with special attention to the practical issues associated with forming these partnerships. It offers a model that can be easily adapted in most communities. The chapter then discusses a federal initiative designed to encourage these partnerships. The chapter closes with examples of university–community partnerships aimed at creating environmentally sustainable economic development.

History of University–Community Partnerships

University and community partnerships and collaborations have a rich history in the United States. Schools of law and medicine have long emphasized community practice and education, business schools have supported entrepreneurs and small businesses with technical assistance centers, and schools of public affairs and planning have created lasting connections with local and state governments (Keating and Sjoquist, 2000, 142). These collaborations are successful because colleges and universities have the resources necessary to solve problems. Faculty members can provide academic and professional experience, and universities can share libraries, laboratories, and technology (Checkoway, 1997, 308).

University–community partnerships have taken many forms, including service-learning opportunities, university–school district partnerships, literacy outreach programs, neighborhood and community development projects, and workforce development initiatives (Miller and Hafner, 2008, 68). There is not one optimal model of university–community partnerships (Duenes et al., 2001, vii). Nevertheless, there are best practices in how to establish these partnerships and lessons that are valuable in any situation.

Despite a deep well of examples on which to draw, the concept of university–community partnerships continues to elude both local leaders and interested administrators and faculty. Some may try to define these collaborations in similar terms as public–private partnerships, but to do so would not provide a complete understanding of what these collaborations could and can be. At their basis, university–community partnerships are arrangements where both entities come together to match institutional resources with the needs of the community to serve a public interest (Gronski and Pigg, 2000; Mayfield and Lucas, 2000, 174). In

many cases, the community accesses these institutional resources at little to no cost, both in terms of leveraging the knowledge and expertise of faculty and, in some instances, having physical space on campus to provide a coordinating location for the activities.

These collaborations also differ from public–private partnerships in that colleges and universities must continue to coexist with community members and, thus, have a vested interest in creating good outcomes from the project. In contrast, an outside consultant or private partner is unlikely to remain in the area after a project and, therefore, may be less worried about the long-term consequences (Lieberman, Miller, and Kohl, 2000, 167). Also, university–community partnerships are unlike public–private partnerships in that they are not defined by contracts and legal responsibilities. Instead, they are about weaving colleges and universities into the fabric of the community. Through these collaborations, universities can become vested members of the community by leveraging institutional resources to find solutions for pressing public problems and facilitating the improvement of their communities and the lives of residents.

Institutions of higher education have recently renewed and increased the numbers of collaborations with local governments in an effort to reemphasize their missions of service beyond the task of educating the public (Campus Compact, 2012). This resurgence is linked to a growing trend in academia to reconnect with earlier traditions of service. However, many of these collaborations serve a dual purpose. Like the communities they serve, colleges and universities have suffered drastic cuts in funding. In an effort to demonstrate the value they bring to their communities, colleges and universities are holding up these partnerships as one of many reasons for slowing or reversing the downward trend of higher education funding. Finally, as the cost of higher education continues to rise for students, many are demanding more applied training to help with their job prospects upon graduation, which these partnerships can provide.

Establishing University–Community Partnerships

Colleges and universities may be lacking in their strategies to commit to public service in the way defined in this chapter, and most communities with colleges and universities do not have strategies for tapping into the expertise and resources of those institutions (Checkoway, 1997, 310). Thus, this chapter discusses establishment of these partnerships from a neutral perspective, meaning that the steps outlined are described in such a way that faculty and administrators or members of the community can adapt the recommendations for their particular vantage point. The underlying assumption is that collaboration will require a relationship in which both parties contribute to planning and to implementing that plan (Wiewel and Lieber, 1998, 294).

Identifying the Partners

Before discussing the steps to forming a partnership, it is important to discuss what constitutes or defines a college or university's community. The question of how to define the community can be complicated (Stukas and Dunlap, 2002). Institutions looking to work with communities commonly assume that they can develop a single, uniform definition of whom and what the community is (Miller and Hafner, 2008, 69). Similarly, communities might not be sure if an institution is part of their community if it is not physically located within their jurisdiction. There is no one definition of *community* and the word cannot be defined simply as the political jurisdiction in which the college or university is located (Kone et al., 2000).

In a 1995 survey, half of responding universities reported that they served a specific region of their state; 39% identified their local area as their service area, and many reported serving both when it comes to university–community partnerships (Scott and Ludwig, 1995, 58). Universities responding that they had a regional service area included institutions commonly referred to as regional comprehensive universities. For example, West Chester University of Pennsylvania has a mission-driven obligation from the Pennsylvania State System of Higher Education Board of Governors to serve the citizens of southeastern Pennsylvania. Accordingly, the institution broadly defines its community as including the counties and municipalities in the southeastern region of the state. In this case, it is likely that a university–community partnership with this institution will not necessarily be with the locality in which it is located.

In the same survey, for institutions responding that their service area was more local, some entered into partnerships with communities that were close in proximity, but this was not always true, because local service areas can vary greatly. For example, the local service area for Kennesaw State University's service area includes the communities that are home to the 5 million people in the Atlanta metropolitan area (Scott and Ludwig, 1995, 59).

The question remains of how institutions define *community* and how communities know which institutions they should approach. The answer depends on mission, location, and other factors. However, a number of things are certain. First, a college or university should look to its mission to identify its community. In cases where the mission is not explicit about the communities served, a proxy is to identify where the students come from. If an institution serves large percentages of students from certain geographies, those communities may well be part of the service area. Second, a college should not assume that its community is the one in which the campus is physically located. Third, a community should not think that because an institution is not located in its jurisdiction that it is unable to enter into a university–community partnership. Many institutions have large or regional service areas, and the term *community* is not meant to be limiting or narrow in the jurisdictional sense.

Stages of the Process

The process of creating a university–community partnership generally includes the following features (Miller and Hafner, 2008, 73):

- Well-defined steps and methods that articulate when and how each milestone will occur
- A cohesive money management strategy that follows the program from beginning to end
- A comprehensive definition of the role each participant is expected to play
- A plan for integrating university and community resources so that each group is continually involved throughout the project.

While using the following model for establishing a university–community partnership, care should be taken to incorporate these features to ensure successful collaboration.

A university–community partnership can be established in three stages: (1) an engagement stage where participants are identified and connections are forged, (2) a deliberation stage where the issues are explored and agreed upon and an agenda is created, and (3) the final stage where the partnership commences upon a course of action and implements the planned activities (Thompson, Story, and Butler, 2003, 389). As is outlined in Table 7.1, each stage of the process has a number of possible strategies and outcomes.

From the beginning, it is important to ensure that there are partnership champions on both sides of the table (university and community) and at multiple levels (Johns Hopkins Urban Health Institute, 2007, 3). Individuals committed to and invested in the success of the partnership will ensure its continuation in the face of obstacles. Partnership champions are needed both at higher levels and on the ground where program activities occur. High-level leaders show that the organization is committed to the partnership, but the daily activities of the partnership depend on program-level leaders (Miller and Hafner, 2008, 72; Wiewel and Broski, 1997, 5).

The involvement of top-level institutional leaders is especially important for faculty members, who can be uncertain of the institution's level of commitment. When higher-level support and leadership exists, faculty can be assured that the project will have professional meaning (Checkoway, 1997, 311). It is also important that the leadership on both sides of the partnership be accountable, dynamic, and enthusiastic enough to inspire people to join the effort (Torres and Schaffer, 2000, 101).

Engagement

The first stage of creating a partnership is engagement, which is focused on bringing the college or university and community partners together. Engagement can happen in a number of ways. It can arise from a request from community leaders

Table 7.1 Strategies and Outcomes by Stage of Partnership Formation Process

Stage of Process	*Possible Strategies*	*Outcomes*
Engagement	Assets and needs assessment via individual groups	More recognition in community, greater knowledge interviews and focus of community, cooperative relationships
Deliberation	Town hall meeting or other open forum	Issues selected and framed congruent with community values, agenda set congruent with community preferences, increased sense of community, increased sense of empowerment
Implementation	Best practices search, grant applications, working committees	Community-based recommendations for policies and programs, community-owned programs, increased political literacy

Source: Thompson, L., M. Story, and G. Butler. 2003. *Health Promotion Practices* 4: 385–392. With permission.

to the institution to assist in addressing some issue or need (Bringle and Hatcher, 2002). Alternatively, the institution may reach out to the community to offer assistance, possibly after identifying a problem or policy opportunity on its own. Some colleges and universities have issued requests for proposals to their communities, offering assistance in specific areas or on a particular policy issue. Those approaches, however, are less likely to be successful; those that are the outcome of existing conversations have a better track record. Requests for proposals tend to be less successful because of a lack of needed information to effectively address the issue or problem and a lack of existing trust on the part of the community in regards to the university personnel they would work with during the partnership (Wiewel and Broski, 1997, 5).

Each entity should evaluate the other as a potential partner by thinking through the following questions (Johns Hopkins Urban Health Institute, 2007, 3; Torres and Schaffer, 2000, 101):

- Are they well regarded and connected to the community?
- Does their past record indicate that they are a team player?
- Are they seriously committed to affecting real outcomes?
- Do they have the time and resources to live up to their end of the bargain?

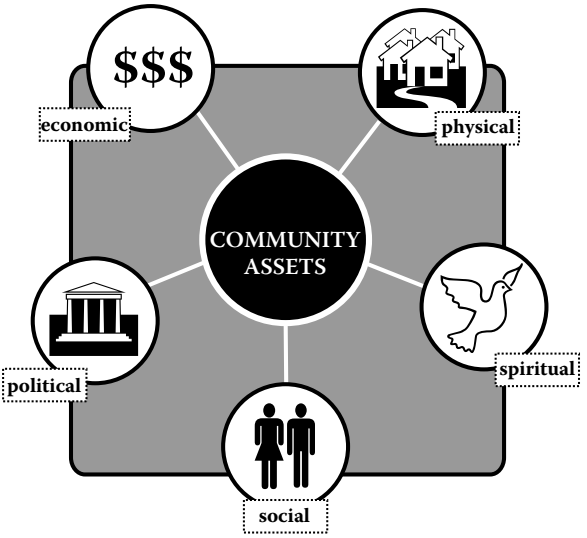

Figure 7.1 Community assets for university–community partnerships. (From Miller, P., and M. Hafner. 2008. *Educational Administration Quarterly* 44: 66–110.)

- Are they committed to seeing the project through in the longer term?
- Does the project sufficiently meet the needs and benefit both parties?

Some of these questions are meant for the college or university to consider, but others are applicable to both parties. Perhaps most important, each partner should establish up front if each has the capacity to carry out the partnership and if both are articulating a strong commitment to the project. Ultimately, it is essential that both sides understand the other's interests in the project and respect that each has distinct goals in pursuing the project (Mayfield and Lucas, 2000, 174).

Strategies for engagement include conducting an asset or needs assessment to identify what resources each partner has and what needs are present. An asset assessment is the preferable place to begin because it focuses on the community's resources, which allows the partnership to build on the strengths of the community rather than focusing on its weaknesses (Schorr, 1997).

Assets can be found in a number of areas within the community (Figure 7.1). They range from the actual built environment including land and existing structures to the human resources of a community including political and faith-based organizations. Asset analyses are essential to the success of the partnerships. Without data on what resources are available and what the needs are, the project can set out on the wrong path by targeting the wrong issues and planning for irrelevant outcomes (Suarez-Balcazar et al., 2004).

Each partner's perception or understanding of the problem is usually laden with personal biases and assumptions. Thus, it is essential to accept and discuss that each of the partners is approaching the partnership from a different frame of reference. By accepting each other's frames of reference and working together to create a new, shared frame for the problem, the university and the community can truly begin to collaborate (Gray, 2004, 167). If this step is not taken, the partnership may fail. When a common frame of reference has been identified, the partnership can be founded on a shared vision and on clearly articulated values (Torres and Schaffer, 2000, 101).

Both asset and needs analyses and discussions regarding each partner's frame of reference generally lead to greater recognition and better understanding of the problem, and of the partnership itself, by members of the community and employees of the institution. If done with intentionality, the engagement process also may generate a greater sense of shared ownership and community among participants.

Last, it is important to have ongoing communication between partners (Gilderbloom and Mullins, 1995). While this is true for all phases of the process, the reality is that good communication in the beginning sets the tone for the rest of the project. It is also important to note that communication goes beyond having scheduled meetings. All participants must be well-informed and included throughout all stages of the partnership. Trust can be built gradually through meetings, e-mails, phone calls, and other means of communication (Schumaker, Reed, and Woods, 2000, 204).

Deliberation

The second stage of developing a university–community partnership is deliberation. During this stage, data from the initial analyses are leveraged to select project goals and objectives. Participants should ensure that the issues selected and framed, as well as the agenda, are congruent with community values (Thompson, Story, and Butler, 2003).

Town halls and open forums encourage community-wide deliberation. Partners should be thoughtful when considering which method of deliberation to choose and should evaluate whether all sectors of the community are being reached. Successful partnerships use a model of deliberation that meets both institutional and community needs and is able to incorporate and balance the values of both (Johnson et al., 1995). Ensuring that community values and priorities are considered at all stages will lead to community buy-in, a necessary requisite for success. Partners also must accept that problems are complex, and, thus, many groups in the community must participate to arrive at a solution that addresses all dimensions of the problem (Torres and Schaffer, 2000, 102).

The deliberation phase is especially important in that the guiding principles of the project are chosen, and the goals and objectives will follow from those tenets. Successful partnerships take time during deliberation to establish and communicate a mission and a vision (Overton and Burkhardt, 1999). After choosing a mission

and a vision that flow from community-wide discussions and analyses completed during the engagement process, the partnership can align its activities and efforts with them, which helps the partnership achieve its objectives. Furthermore, if an assets-based approach is emphasized, the mission statement and goals can reflect the strengths of the community and the partnership (Taliaferro, 2004, 42).

Goals can be broken up into two types: instrumental and ultimate (Batson, Ahmad, and Tsang, 2002, 431). Instrumental goals are separate and discrete objectives that are accomplished in pursuit of the overarching objective. In contrast, ultimate goals are the bigger goals that the project hopes to achieve (Batson, Ahmad, and Tsang, 2002, 431). It is important to distinguish between the two, and it is necessary to have both. For example, the ultimate goal of a university–community partnership may be to revitalize a specific neighborhood or to increase the sustainability of a community. In pursuit of this ultimate goal, instrumental goals may include redeveloping a parcel of land in one area and creating open space in another.

When designing a comprehensive plan for a partnership's objectives, the approach should be comprehensive. It should include a mission, a vision, guiding principles, and instrumental and ultimate goals. Partnerships are only as good as their plans, and planning has always been a hallmark of successful partnerships (Gilderbloom and Mullins, 1995, 92).

Implementation

The final stage in creating a university–community partnership is implementation. During this phase, the partnership will seek out the appropriate methods for achieving its goals and objectives. This may include a search for best practices, the submission of grant applications, and the establishment of working committees to distribute and assign the work of the partnership (Thompson, Story, and Butler, 2003). As important as planning was to the other stages, it is even more important in this final stage. Implementation planning should include creating a timeline, identifying due dates for project deliverables, and assigning responsibility for activities to groups or individuals.

Because community members—unless they are municipal employees—are likely to be volunteers, the implementation phase is prone to the university partner becoming the dominant player in the partnership. Thus, when implementing the activities of the partnership, special attention should be paid to the issue of community involvement. If participants from the community become disengaged from the work of the partnership, the sense of community ownership and interest can begin to fade.

The final step in implementation of a partnership is its end. Few partnerships are entered into as long-term agreements. When the objectives have been accomplished, the partnership can be dissolved with the parties on good terms. If the partnership fails, proper acknowledgement of this failure can maintain respect between partners (Johns Hopkins Urban Health Institute, 2007, 6). In any event,

the dissolution of a partnership should be discussed in advance and possibly as part of the engagement process. This sets expectations for both parties in terms of what level of time and resources will be committed to the project. Even in the event of failure, a positive departure is something worth working toward, as it is important to leave open the possibility of future partnerships.

Challenges to University–Community Partnerships

Three main types of challenges in creating a university–community partnership involve communication, relationship management, and capacity planning. In the end, these challenges can be overcome with proper planning, open dialog, and a collaborative approach.

Communication

Despite the potential rewards of forming partnerships with colleges and universities to solve public problems, many communities with institutional resources in their backyards are not engaging in these collaborations (Checkoway, 1997, 307). In a number of these cases, communities fail to do so out of a lack of information on how and where to begin. For communities that are able to access their institutions, many find the process difficult and confusing in terms of who to contact and how to coordinate and formalize the partnership.

Many difficulties in establishing these partnerships can be linked to the administrative structures and processes inherent in most colleges and universities, which were not designed with community interaction as their primary purpose (Harkavy and Wiewel, 1995). In terms of processes, institutions of higher education suffer from a propensity to arrange themselves in silos, with little opportunity for interaction among departments and units. Thus, there may be a lack of communication within the institution and, ultimately, in partnerships (Gronski and Pigg, 2000). Poor communication is especially insidious for university–community partnerships because it leads to community members perceiving a lack of focus and commitment by the institution (Miller and Hafner, 2008).

To address this issue, community leaders should identify a top-level institutional leader or a faculty member with the ability to connect the community partner to an appropriate institutional counterpart. Through this contact, a process can begin by which the institution sets in place a framework for the community member to access the appropriate personnel to form the partnership team. This framework is likely to be ad hoc and temporary for the purposes of the initial engagement. However, hopefully an administrative structure will be put in place that makes accessing the institution less difficult (Wegner, 2000). Whether temporary or permanent, these communication structures must be put in place to help faculty and students identify opportunities for partnering with the community.

The university also must create procedures for providing technical support and evaluating program results (Ramaley, 1995, 31).

Relationship Management

University–community collaborations often fail because of an imbalance in the power dynamic of the partnership (Miller and Hafner, 2008, 70; Strier, 2011). In most cases, the institutions are providing a majority of the resources, including funding and personnel. This may result in the community feeling less like a partner or, in a worst-case scenario, a university assuming it can dictate the terms of the partnership. It is essential that a framework be developed up front that acknowledges the contributions of both partners and ensures the equitable participation of both, regardless of the investment of resources.

It is important for all participants to keep in mind that successful partnerships emerge out of social relationships and power relations of mutual trust and respect (Hansen and Lehmann, 2006, 820). A power dynamic should be avoided in which one participant or group is characterized as the expert who conveys knowledge to the other, who is characterized as the learner. In these situations, the learner disengages because of boredom and a lack of participation (Thompson, Story, and Butler, 2003, 386).

Universities may find these types of collaborations challenging because they sometimes have to decide between achieving the intended outcomes or maintaining the relationship with the community partner. If it is not possible to do both, one of the partners may choose to preserve the relationship instead of meeting the planned objectives (Duenes et al., 2001, vii). Therefore, as mentioned previously, it is helpful to have a graceful exit strategy in place.

Capacity Planning

Another challenge is the issue of capacity—from the perspective of both the institution, in providing needed resources, and the community, in sustaining an appropriate level of participation from its members, especially volunteers. An additional complication is that universities and community partners have trouble estimating their own capacity, let alone their partner's. It is necessary that an honest discussion happen early on that establishes each partner's capacity and ability to commit resources to the project, so that expectations can be managed.

Federal Efforts at University–Community Partnerships

The federal government has created programs and offices within its agencies to encourage community outreach on the part of colleges and universities. These programs represent a concerted effort by the government to create and facilitate

meaningful and long-lasting partnerships between communities and their colleges and universities (Lieberman, Miller, and Kohl, 2000). Up until fiscal year 2005 (the last time these grants were funded) government assistance for university–community partnerships came from the Community Outreach Partnership Center (COPC) program of the U.S. Department of Housing and Urban Development (Maurrasse, 2001, 23). The program, initiated in 1994, has invested approximately $45 million in more than 100 colleges, universities, and community colleges to facilitate community partnerships (Vidal et al., 2002, i). Funding under this program required that 75% of the grant award support outreach efforts, and no more than 25% could be spent on research (Anglin, 2011, 187).

The program offered two kinds of grants: New Grants and New Directions Grants. New Grants were for eligible institutions that had never received an award under the COPC program and whose application addressed three or more urban problems. New Directions Grants were for previous recipients under the first program that were seeking to implement new activities in a current COPC neighborhood or the same or other activities in a different neighborhood.

COPC sought to fund programs that were designed to tackle multidimensional community problems in a comprehensive way. Programs addressed the following issues (Office of University Partnerships, 2012):

- Workforce development
- Homelessness and housing discrimination
- Affordable housing
- Financial and technical assistance for businesses
- Skill and capacity building for community groups and residents
- Community and vision planning

The Office of University Partnerships still has a number of active grant programs. Their future, however, is uncertain in that many have not been funded for fiscal year 2012. These programs include Hispanic-Serving Institutions Assisting Communities (HSIAC), Historically Black Colleges and Universities (HBCU), Tribal Colleges and Universities Program (TCUP), and Alaska/Native Hawaiian Institutions Assisting Communities (AN/NHIAC). For each of these programs, the goal is to connect colleges and universities to their neighborhoods to address housing, economic development, and neighborhood revitalization needs (Cisneros, 1995).

Partnerships for Sustainability and Economic Development

University–community partnerships include some programs that pursue sustainability and economic development at the same time. One salient reason is that

institutions of higher education are uniquely situated to address the issue of sustainability given the range of disciplines represented and the tools and research available for pursuing these types of efforts. The following sections present two examples of such partnerships.

SmartStreet, Grand Rapids, Michigan

The SmartStreet project is an effort to reduce energy consumption in the East Hills neighborhood of Grand Rapids, Michigan. The university-community partnership involves Consumers Energy, Grand Valley State University, and Grand Rapids Community College, in addition to other sponsors. In 2011, the partnership initiated a year-long project that involved installing smart meters at 60 homes and commercial properties. Participants received an energy audit in addition to energy-efficient lighting and access to web portals and home energy display units that allowed them to track and control energy use (Consumers Energy, 2012).

Initial estimates of the impact of the partnership indicate that commercial participants will collectively save nearly $20,000 per year. Residential participants are expected to decrease their collective natural gas use by up to 265,000 cubic feet a year. Based on average use in the area, those savings are enough to serve more than two additional homes (Consumers Energy, 2012). Between residential and commercial participants, the impact on the environment will be considerably less, including the following reductions in emissions:

- 378,179 pounds of carbon dioxide
- 1,216 pounds of sulfur dioxide
- 346 pounds of nitrogen oxide

The total impact of those reductions is the equivalent of removing 39 cars from the road (Consumers Energy, 2012).

Sustainable City Year, University of Oregon

The Sustainable City Year program at the University of Oregon is designed to assist small- and medium-sized cities in incorporating sustainability practices into their communities. The initiative addresses the issue of a lack of a capacity among local governments, in terms of both expertise and personnel, to meet the demands of sustainability. To ensure that program activities are relevant to each community, university professors and students collaborate with city staff members to develop project plans (Sustainable Cities Initiative, 2012).

One project resulting from the Sustainable City Year Program was a year-long look at the North Downtown Waterfront site in Salem, Oregon. This location is replete with industrial buildings, car lots, and other stand-alone businesses that do

not make full use of the potential value of the waterfront area (Schmidt and Larco, 2011, 8). The results of the project included architectural designs for a Salem River Research Center, brewpubs, museums, recreation centers, hotels, and residences, all in keeping with sustainable design practices.

Salem's project manager, Courtney Knox, described the waterfront study as "an opportunity to look seriously at the gradual transition from industrial into something more active and profitable" (*Salem Business Journal,* 2011). The total amount of consulting and deliverables, including architectural drawings, is valued at more than $12 million, which would be the ordinary cost for the kind of consulting provided by the program (*Salem Business Journal,* 2011).

Conclusions and Concepts in Action: University of Illinois at Urbana-Champaign's Smart Energy Design Assistance Center

A number of universities have developed institutional missions and structures to encourage university–community partnerships. Some examples are Emory University's Office of University–Community Partnerships, University of Pennsylvania's Netter Center for Community Partnerships, and Case Western Reserve University's Center for Community Partnerships. These are exemplars of institutional design, but much more work remains to be done in this area. It is worth noting that in cases where universities have been challenged to serve their communities, they have responded by creating programs that address inner-city poverty problems and many other policy areas (Keating and Sjoquist, 2000, 142).

Communities also are looking to modify their structures and operations to leverage the resources of colleges and universities. One example is the Boston Redevelopment Authority, which has an employee who acts as a liaison between the city and its many universities and colleges (Sungu-Eryilmaz and Greenstein, 2010, 8).

During the current fiscal downturn, communities and universities should step up their efforts at collaboration to create programs that influence the public good (Smerek et al., 2005, 7). Especially given the pressing demands for economic development and environmental protection, universities are well positioned to assist communities in pursuing these important objectives. In the case study that follows, the University of Illinois' Smart Energy Design Assistance Center partners with businesses to analyze their energy use and help them increase their bottom lines, which allows them to reinvest savings in the community.

CASE STUDY: ENERGY EFFICIENCY IN NICHE MARKETS

Attention to energy systems, performance, and costs is fast becoming an indicator of overall corporate performance and good management. Most commercial buildings use from 10 to 30% more energy than necessary. This translates into abundant opportunities to save both energy and bottom-line operational costs. Cutting a typical commercial building's energy use by 30%, for example, can yield the same bottom-line benefits as a 3% increase in rental income or a 5% increase in net operating income.

In grocery stores, these bottom-line benefits can become critical to the store's overall viability. In a typical grocery store, energy is about 1% of total store costs. While it is a small percentage, this 1% usually represents the store's approximate profit margin. This means that in a typical grocery store, a 10% decrease in energy costs equates to a 10% increase in profits (National Grid, 2002). According to the U.S. Environmental Protection Agency, $1 in energy savings is equivalent to a $59 increase in sales for an individual grocery store (ENERGY STAR, 2008).

Energy Needs of Supermarkets

According to a 2003 U.S. Energy Information Administration survey, supermarkets in the United States use about 51 kWh of electricity (174,019 BTU equivalent) and 41 cubic feet of natural gas (46,355 BTU equivalent) per square foot on an annual basis (Energy Information Administration, 2003). This represents annual usages of more than 220,000 BTUe (BTU electrical) and expenditures of $5.31 per square foot for electricity and $0.38 for natural gas. Thus, an average-sized store (approximately 40,000 square feet) can expect to pay about $230,000 in annual energy expenses for use of approximately 8,800 MBTUe (million BTUe) and, consequently, produce 1,900 tons of carbon dioxide emissions.

In Illinois, the number of grocery stores and supermarkets has been estimated to exceed 4,500. This means that the total energy consumed by this market sector is about 3.9 trillion BTUe, with annual energy costs in the $1 billion range. Clearly, transforming this market by reducing consumption, increasing efficiencies, and reducing waste can have a large impact on energy use and emissions (National Grid, 2002).

In a typical supermarket or grocery store, refrigeration and lighting can represent more than half of the operation's total energy use. In-store refrigeration systems have several objectives. They not only spot-cool the shelved product to maintain specific product temperature requirements, they also must allow easy viewing and selection by the consumer. The in-store refrigeration process also generates enormous amounts of waste heat that needs to

be either reconditioned by building heating, ventilation, and air conditioning systems or dumped outdoors, especially in warm climates or summer months. In cold-weather climates, this waste heat can be beneficial, although its location can affect heating systems cycles. Improvements made to refrigerated display cases, coolers, freezers, and refrigeration components can usually generate large energy and cost savings. Also, lighting in a typical supermarket or grocery store is needed for general store visibility, product visibility, exterior signage, and parking lot visibility. Lighting typically accounts for about 13% of all electrical energy consumed (National Grid, 2002).

This case study presents the results of an analysis of a typical supermarket by the University of Illinois' Smart Energy Design Assistance Center (SEDAC). SEDAC is a program that was founded to help small businesses in Illinois be competitive in the global marketplace by helping them reduce operational energy expenditures. The case study introduces SEDAC and some of its program outcomes to date. It then reports on a specific SEDAC grocery store project, the strategies considered for energy conservation, and the final outcome of the analysis. This section concludes with a discussion of the value of SEDAC and state-level programs that engage businesses in energy conservation and efficiency.

Illinois Smart Energy Design Assistance Center

The SEDAC, which is operated by the University of Illinois, provides outreach, training, and design assistance to Illinois businesses and public entities in energy efficiency. SEDAC was developed in 2004 by the Illinois Department of Commerce and Economic Opportunity as part of the Small Business Smart Energy program. In September 2008, under the Illinois Energy Efficiency Portfolio Standard, SEDAC program sponsorship expanded to include Ameren Illinois Utilities and ComEd and began offering program services to public sector buildings. In June 2011, Ameren Gas, Nicor, North Shore Gas, and Peoples Gas also became program sponsors.

As of September 30, 2011, SEDAC had provided information and support to 2,476 Illinois clients. The entities represented by this number employ more than 67,000 people, encompassing a geographical cross section of the state. Of these clients, 886 have received energy auditing services.

Clients that receive design assistance through the SEDAC can potentially save 2,103,282 BTUe of energy annually, which also provides environmental and public health benefits, including the prevention or avoidance of significant annual emissions (Table 7.2).

Economic analysis for clients suggests that participants can achieve a good return on investment, with total annual savings of more than $34,600,000

Table 7.2 Environmental Benefits of Proposed Energy Savings
Annual Reduction
342,835 tons of carbon dioxide (CO_2)
917 tons of sulfur dioxide (SO_2)
416 tons of nitrogen oxides (NO_x)
52.54 tons of carbon monoxide (CO)
1.19 tons of particulate matter (PM_{10})
3.46 tons of volatile organic compounds (VOCs)
3.25 tons of methane (CH_4)
4.18 tons of nitrous oxide (NO_2)
21.03 pounds of mercury (Hg)
Source: Conversion factors were taken from the report "Emissions Factors and Energy Process for Leonardo Academy's Cleaner and Greener Program," May 2010, by Leonardo Academy, Inc.

and an average annual rate of return of more than 25%. This represents a net present value of more than $170 million.

A SEDAC Grocery Store Case Study

The store from this case study is a conventional masonry and brick building located in east central Illinois. It measures 150 × 180 feet, with an extended lighted parking lot for 157 cars. A bakery and deli occupies 1,200 square feet in the southwest corner of the building. A banking facility operates during store hours from a 450-square-foot space at the front of the facility. This 27,000-square-foot, single-story structure is adjacent to and has a common wall with a heated office building along a west wall. Building offices occupy 13 feet of the building along the east wall.

The retail sale of grocery items occurs daily from 7 a.m. to 10 p.m., with few exceptions. Customer occupancy can vary up to 40 or more people at any given time. Internal heat-generating loads include considerable lighting, numerous stand-alone refrigeration devices, and a few office machines in the banking and general offices. Internal lighting includes 4-foot and 8-foot fluorescents, with fluorescent tube lighting in the food cases.

Space heating and air conditioning is provided mainly by a variety of rooftop units. However, two overhead, Modine-style, gas-fired units provide

heating in the food storage area. The air conditioning condenser for this ducted system is rooftop mounted; cooling coils are within the duct. This unit also provides fresh air induction.

Energy and Economic Analysis

SEDAC provides various levels of assistance, and, for this particular client, the center determined that a site visit was warranted. It then developed a computer model to study energy consumption trends and conservation opportunities. The grocery store owner was the host for the site visit. He provided a copy of the building plans and arranged for supply of the monthly electric and gas bills from the past three years.

The energy and economic analysis performed on this building involved five steps. First, the baseline energy model was constructed in TRACE 700, a software product developed by the Trane Company. TRACE 700 performs an hourly building energy simulation, which calculates the amount of energy (and the resulting utility cost) that the building is expected to use over an entire typical weather year. Model inputs included building geometry and orientation, wall and roof details, window area and type, type of heating and cooling system, type of lighting, local weather information, and schedules regarding lighting usage, internal equipment usage, and occupancy. This baseline computer model showed the building's estimated annual energy consumption and utility cost. It also simulated expected energy consumption, but this is no guarantee; a building's actual energy consumption strongly depends on the exact way it is constructed, operated, and maintained.

Second, the utility bills calculated by the computer model were calibrated to actual past utility bills. This provided a reality check on the utility cost numbers generated by the computer model and established a legitimate baseline model of the building's energy usage and costs. This calibration used the historical utility data from the store's utility bills.

Third, the calibrated energy model was used to disaggregate the existing building's energy usage. *Disaggregation* refers to breaking down the annual energy usage into its end uses, such as lighting, cooling, and refrigeration. This process showed where the most energy was being used in the facility and allowed SEDAC and the owner to set priorities.

Fourth, SEDAC performed an analysis of energy cost-reduction measures (ECRMs). These alternatives were generated after review of the existing building to determine what ECRMs should be investigated. The baseline computer model was then changed to reflect the implementation of these

ECRMs, and the model generated the resultant energy consumption and expected utility costs associated with the implementation of each ECRM.

Fifth, the annual energy and utility cost savings of each ECRM were used to generate the net present value (NPV) and internal rate of return (IRR) associated with each ECRM. This analysis used estimated first costs (the amount the owner would have to pay to implement each ECRM) and the life-cycle cost (LCC) of each potential ECRM. The LCC, NPV, and IRR provided the owner with a much better means of appraising the economic viability of ECRMs than would be the metric of simple payback, which is the amount of time it takes to recover the initial investment in energy savings.

Existing Energy Profile

An analysis of the utility bills indicated that while the electricity usage does peak in the summer, there is a large, year-round electricity base load (Figure 7.2). Electric energy consumption is characteristically high due to the consistent refrigeration load in the facility. Also, natural gas usage (Figure 7.3) closely follows the outside air temperature. In the summer, natural gas costs diminish to a little more than $200 per month. This indicates that natural gas is used only for space heating and minimal water heating.

Benchmarking

The U.S. Environmental Protection Agency's ENERGY STAR program has established Target Finder, a benchmarking system for commercial buildings in the United States. The energy use intensity generated by the Target Finder reflects the distribution of energy performance in commercial buildings derived from data from the Commercial Buildings

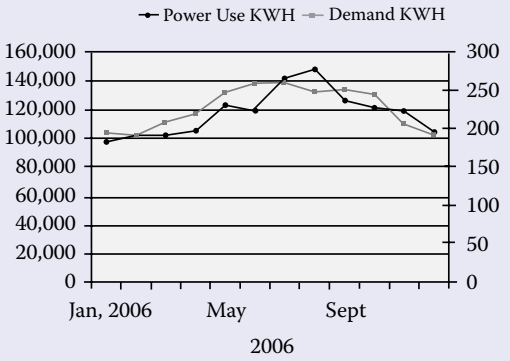

Figure 7.2 Existing power use and electrical demand.

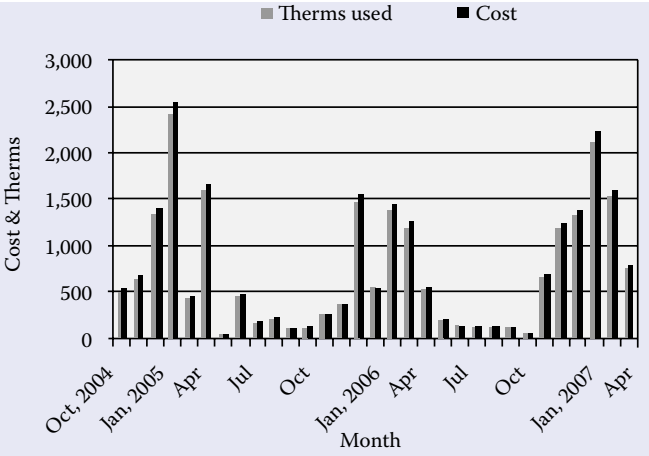

Figure 7.3 Existing natural gas use.

Energy Consumption Survey of the U.S. Department of Energy's Energy Information Agency.

The data inputs required to run the Target Finder were identified as the primary drivers of energy use. The store's zip code was used to determine the weather conditions that the building would experience in a normal year, based on a 30-year climate average. The total annual energy use intensity for the target was based on the energy sources typical in the region specified by the zip code. For example, an office building in the 20902 zip code would use roughly an 80:20 ratio of electricity to natural gas.

Target Finder was applied to the present store to see how it compared to other grocery stores in the United States. This building ranked in the first percentile nationwide in terms of its energy consumption, or, in other words, approximately 99% of supermarkets and grocery stores in the region use less energy. This was not surprising, given the age of the building and its mechanical equipment. In order to meet ENERGY STAR building criteria (75th percentile or better), energy usage would have to be reduced to 95.3 kBTU/sf (sq. foot) per year.

Energy Cost Reduction Measures

The baseline energy model exhibited the same trends as the store's utility bills to within about 5% of the annual utility costs. This was a reasonable outcome for validation of the computer model. SEDAC then analyzed 10 energy cost-reduction measures (ECRMs) and their internal rate of return (IRR), annual savings, and net present value (NPV).

ECRM1: T8 Lighting for Display Cases

ECRM1 simulated installing new T8 fluorescent lights in place of T12 lights in the cases, on a one-for-one basis. T8 lights are more efficient than T12 lights. T8 lights use an electronic ballast versus the magnetic ballast used in T12 lights. Also, T8 lights use about two thirds of the energy of T12 lights while maintaining the same light output. Because of potentially high installation costs due to the high number of fixtures, this ECRM had an IRR of only 1.5%, an annual savings of $603, and an NPV of $4,746.

ECRM2: T8 Lighting for Ambient Light

ECRM2 simulated installing new T8 fluorescent lights in place of the T12 ambient lighting on a one-for-one basis. ECRM2 had an IRR of 12.1%, an annual savings of $8,430, and an NPV of $8,825.

ECRM3: New Seasonal Energy Efficiency Rooftop Units

ECRM3 simulated new rooftop units rated at 12 for seasonal energy efficiency. This produced a terrific IRR of 50%, an annual savings of $11,612, and an NPV of $71,838.

ECRM4: Ground Source Heat Pump

This ECRM simulated replacing rooftop units with a ground source heat pump connected to a water well drawing out of the shallow (not potable) aquifer from a nearby river. This system would provide approximately 50 tons in cooling capacity. A ground source heat pump system—commonly referred to as geoexchange or geothermal heat pump—is a renewable heating, ventilation, and air conditioning technology that extracts heat from the ground in winter and ejects heat to the ground in the summer. The average ground temperature (about 55°F in Illinois) is generally more thermally advantageous to heat extraction and dispersal than is the air temperature, as used by air-source heat pumps and air-cooled systems. Because the system depends on ground contact, wet soils and water-based systems are most effective. Installing a ground source heat pump system produced a high IRR of 53.2%, an annual savings of $34,503, and an NPV of $217,395. This is a terrific option, although setup costs range from $75,000 to $95,000 and may be prohibitive for some stores.

ECRM5: Refrigerant Ambient Subcooling

Refrigeration condensers are typically designed to cool refrigerant to the condensing point, often returning warm liquid to the coolers in the store. Additional capacity can be gained and energy efficiency can be increased by cooling the refrigerant past the condensing point. In many refrigeration

systems, this additional cooling can be accomplished by controlling the condensers differently or by adding a subcooling coil behind the condenser. In this store's case, it could be achieved by adding controls to subcool the refrigerant when the outdoor temperature permits. Estimation of the savings attributable to this ECRM are $2,197 per year.

ECRM6: Antisweat Heater Controls

Glass doors on refrigerator and freezer display cases are generally electrically heated to prevent fogging and ice buildup, especially on humid days. If not controlled, the heaters will operate continuously and contribute significantly to the utility bill. Antisweat heater controls utilize a digital moisture sensor to detect moisture at a microscopic level before it becomes visible. These moisture sensors automatically turn on antisweat heaters. The antisweat heaters are turned on only when fogging or ice buildup conditions exist, and they are turned off when the heaters are not needed, thus producing energy savings. Annual savings are typically $75 per door, or about $6,000 per year for this store.

ECRM7: ENERGY STAR Vending Machines

Beverage distributors typically provide the refrigerated beverage merchandisers in grocery stores. In return, the distributors receive free dedicated shelf space to sell their products. These units typically operate 24 hours per day and waste energy when the store is closed. Because the beverage distributors do not pay for the electricity to operate these units, they have little incentive to provide more efficient refrigerators.

By allowing only ENERGY STAR–qualified vending machines and energy-efficient refrigerated beverage dispensers in their facility, owners can see a 35 to 50% reduction in energy usage. These qualified vending machines have more efficient lighting, condensers, and evaporator fans and more advanced microprocessor controls. Specialized sensors also can save energy by powering down vending machines during unoccupied times. These controls sense ambient temperature and will periodically turn on the refrigerated units to keep the product cool, ensuring that a customer will always purchase a cold beverage. Annual savings run about $100 per vending machine, or about $400 per year for this store.

ECRM8: Refrigeration System Heat Reclaim

Stores using walk-in refrigerators and coolers can often benefit by recovering the large amounts of heat rejected by the refrigeration system condenser to help meet the store's hot water and space heat needs. During heat recovery, a three-way valve directs refrigerant discharge gas to a coil in the store air handler or hot water tank. Desuperheating and partial or complete condensation of the

gas provides recovered heat. Partially condensed gas and liquid then flow to the condenser, where the remaining condensation occurs. Implementing this ECRM would require extensive refrigerant repiping. Annual savings for this store are estimated at $2,100.

ECRM9: Refrigeration System Floating Head Pressure

The head (or condensing) pressure greatly impacts energy required by the refrigeration system. Refrigeration systems are usually operated at constant head pressure to ensure adequate flow of refrigerant to display cases and walk-in cooler evaporator coils. This means that the system's air-cooled condensers cannot take full advantage of reduced outdoor air temperatures during the fall, winter, and spring.

Today's modern systems utilize balanced port thermostatic or electronic expansion valves that require much less pressure drop for operation. This allows systems to be designed for floating head pressure, which allows the head pressure to be reduced at low outdoor air temperatures, resulting in significant energy savings. Reducing the condensing temperature to 75°F for low-temperature racks and to 80°F for medium-temperature racks will save electricity. Estimated annual savings are about $90 per ton, or about $8,100 for this store.

ECRM10: Efficient Fan Motors

Most fan motors inside display cases are single-phase, shaded-pole motors. These are inexpensive, but inefficient. The operating cost of a fan motor far exceeds its purchase price, so it makes sense to invest in high-efficiency motors. By installing permanent split capacitor motors or electronically commutated motors for fans inside display cases, an owner can see annual energy savings of about $12 per motor, or about $2,500 per year for this store.

Recommendations

The recommendations for this grocery store were a package of ECRMs to defray the costs of some measures and boost the IRR of others. The implementation of some measures that may not pay back their cost as quickly might be made possible by the measures that do. Doing the work as a package enables a more robust and conserving intervention and ensures that the client maximizes energy-saving potential. SEDAC recommended the following package:

1. Replace T12 case lighting and ambient lighting with T8 lighting fixtures.

2. Replace existing rooftop units with a ground source heat pump system connected a water well drawing out of the shallow aquifer under the nearby river.
3. Install ambient subcooling, antisweat heating controls, floating head pressure, and permanent split capacitor fan motors in the refrigeration cases.
4. Install ENERGY STAR vending machines in place of those already on site.

Projected energy savings achieved through implementing these ECRMs are about $55,389 per year (based on an averaged $108,574 per year annual bill for all utilities), with internal rate of return of 29.1%.

Conclusion

According to the U.S. Department of Energy, annual energy expenditures in the State of Illinois have now reached over $30 billion (Energy Information Administration, 2012). Among the policy initiatives and strategies aimed at decreasing this burden on Illinois small businesses is the Smart Energy Design Assistance Center, an organization whose mission is to enhance Illinois energy efficiency and improve the state's economic competitiveness and viability. As of September 30, 2011, the Center has provided information and support to 2,476 Illinois clients. The Illinois entities represented by this number employ more than 67,000 people, encompassing a geographical cross section of the state. Of these clients, 886 clients have received energy auditing services. The program has been successful at reducing the overall energy consumed in the state. Saving over 34.67 million BTUs of annual energy, and over $26.5 million per year for the entities that have taken advantage of the services. This translates into a total program IRR of 25.2% and an NPV of over $170 million. These energy reductions translate directly to additional social and environmental benefits including carbon dioxide, sulfur dioxide, nitrogen oxides, and carbon monoxide reductions.

SEDAC services cover a variety of building types. This case study is an example of a typical grocery store analysis. The analysis showed that this store could reduce its energy use (and total energy costs) by almost 50%. If in a typical grocery store, a 10% decrease in energy costs equates to a 10% increase in profits, then our case study example shows how this store can improve its profits by almost 50%. The rate of return on the investment needed to improve the stores' profitability was a staggering 29.1%. In times of fiscal responsibility, it is hard to imagine a better investment. The

recommended investment was a package of potential ECRMs. A package approach was utilized so that some measures that may not pay back quite as fast might be made palatable by the measures that do. This approach ensures that the client maximizes his/her energy saving potential.

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Chapter 8

Seeking Economic Development through Eminent Domain, Environmental Remediation, and Redevelopment

Although it is a controversial topic, eminent domain continues to be an economic development tool used by public administrators. This tool has a significant connection to sustainable economic development. The way it is used varies by state and locality and depends heavily on the regulatory environment, including federal, state, and local law; political support from community leaders; and public opinion.

This chapter does not take a normative position on the issue of eminent domain. Instead, it summarizes the events that have shaped its use in the United States and provides direction on the intersection of eminent domain, economic development, and environmental remediation. Given these aims, the chapter begins with a discussion of the legal environment of eminent domain including the issues of public use and just compensation. Then it shifts to an examination of its use in an environmental remediation context. The chapter closes with a case study of San Diego,

California's exercise of eminent domain to remediate contaminated properties and spur economic development.

The Legal Environment of Eminent Domain

Eminent domain is an inherently legal action and, thus, operates in an evolving environment of case law, state statute, municipal ordinances, and ballot initiatives (Cypher and Forgey, 2003; Pritchett, 2003). The way eminent domain has been used and the requirements that must be met in order for it to be lawfully exercised have changed over time, and they vary by location (Saxer, 2005). The following discussion provides public administrators and nonprofit managers a clear understanding of the major existing laws on the issue. It includes a summary of eminent domain law before the *Kelo v. City of New London* case (the prevailing law of the land within the United States), a discussion of the case, and an overview of the legislation that has developed in response.

Eminent Domain Interpreted

The Fifth Amendment to the U.S. Constitution addresses the issue of eminent domain, or government claiming of private property. Sometimes referenced as the "takings clause," the last clause of the Fifth Amendment provides that no private property shall be taken for public use without just compensation. Thus, the framers of the Constitution, within the Bill of Rights, implicitly identified a governmental authority to take private property (Benson, 2008; Zax and Malcolm, 2005). However, they placed two significant legal requirements on such actions. The first requirement is that the property taken via eminent domain must be for public use. And, the second requirement is that just compensation must be provided to owners whose property has been taken. The historical and resulting legal environment has been an evolutionary one based on judicial interpretation of the terms *public use* and *just compensation*.

Courts prior to the twentieth century interpreted the takings clause of the Fifth Amendment literally to mean that private property could be taken only for a public use, "intimating public ownership and utilization of the property" (Carpenter and Ross, 2010, 337; Klemetsrud, 1999). However, case law from the twentieth century has since transitioned the meaning away from public *use* to public *purpose* (Diop et al., 2010; Gold, 2007; Kerekes, 2011; Racketa, 2010).

The origins of the expansive interpretation of public use can be traced to the U.S. Supreme Court's ruling in *Berman v. Parker* (1954), when it held that a nonblighted commercial property could be taken as part of a project to redevelop a blighted area in Washington, D.C. Furthermore, the court noted "when the legislature has spoken, the public interest has been declared in terms well-nigh conclusive" (as cited in Robb, 2005, 29). Consequently, as a result of this case, the court

established that the public use requirement of the Constitution could be met if the taking of private property was done in the public's interest (Robb, 2005, 29). And since this ruling, the definition of public use has been inextricably linked to the more permissive term of public interest.

Another important case is *Hawaii Housing Authority v. Midkiff* (1984), in which the Supreme Court ruled that the Hawaii Land Reform Act was constitutional. The act in question permitted Hawaii's public housing authority to transfer property from landowners to tenants as a public policy instrument to address inflated housing prices (Miceli, 2011, 23). Again, the Court continued its preference for deferring to the decision-making processes of a legislative body—in this case a state government—and reaffirmed its position that the Constitution's public use requirement could be met vis-à-vis serving the public interest (Ackerman, 2004; Birch, 2012). It is important to note that the court generally includes any governmental or quasi-governmental body in its definition of legislative bodies. Thus, judicial deference in terms of which bodies can divine the public interest is not limited only to federal and state governments, but extends also to municipalities and public boards or redevelopment agencies (Oswald, 2012).

Kelo v. City of New London

It was not until 2005, when the Supreme Court reaffirmed *Midkiff* in *Kelo v. City of New London*, that the Court substantively revisited the public use requirement (Kotlyarevskaya, 2005). The case settled the constitutional question that received conflicting interpretations at the state level as to whether economic development constituted public use under the expansive interpretation of the term.

Arguably one of the most significant legal events to occur in recent economic development and eminent domain history occurred on June 23, 2005, when the Supreme Court ruled "economic development is a public purpose for which a government may use its eminent domain power under the Takings Clause of the United States Constitution" (Williams, 2009, 183). The facts of the case are worth reviewing in order to provide greater context for the resulting laws that have emerged in response to the decision. The case and ensuing legislation are significant indicators of the gravity with which eminent domain should be considered. More importantly, the discussion helps to outline the requirements, beyond those in the constitution, which must be met in order for eminent domain to be exercised.

Pfizer Inc., a large pharmaceutical corporation, announced in 1998 that it intended to build a $270-million research facility in New London, Connecticut, on a site located adjacent to the Fort Trumbull neighborhood. This area could be described as blighted: many nonresidential buildings were vacant, the buildings needed remodeling, and less than half of residential properties were in average or better condition (Morandi, 2012). As a result, the city became interested in redeveloping the neighborhood near the planned Pfizer site to increase tax revenues,

create jobs, encourage the public to gather on the waterfront, and act as a catalyst to revitalize the city (Carroll, 2006, 85).

To facilitate the transformation of the Fort Trumbull area, the city engaged the assistance of its development authority—the New London Development Corporation (NLDC), a nonprofit, 501(c)(3) organization established under state law in 1978 that had been inactive since the mid-1990s (Cosgrove, n.d., 2). NLDC, like most local development corporations, was formed to provide assistance and leadership for economic development-related activities in the City of New London. For this redevelopment project, the city provided NLDC its authority to use eminent domain for the acquisition of properties in the Fort Trumbull neighborhood (Legal Information Institute, 2012). Of 115 properties in the neighborhood, 100 were sold on a voluntary basis to the development corporation (Morandi, 2012). NLDC took action on the remaining 15 properties through its eminent domain authority.

In response, Susette Kelo and the other homeowners filed suit in the Superior Court of Connecticut, arguing that the development plan did not constitute public use under the Fifth Amendment of the Constitution. They argued that their properties were being taken for purposes outside the requirement, given that the plans were calling for research and office space and park support to be located where their homes were. While the Superior Court determined that takings benefiting private parties could constitute public use, insofar as it was incidental to the public interest, it ruled in favor of the homeowners. The Court ruled that the plan was unreasonable, given witnesses' inability to describe the intended use, and there was no evidence to suggest that the homeowners could not have remained under a modified plan (Rutkow, 2006, 262–263). The Court, however, placed an injunction on development of both parcels pending appeal.

The case was appealed to the Connecticut Supreme Court, which affirmed the lower court's ruling that the taking of private property could accrue benefit to another private party and meet the public use requirement, as long as the exercise of that power was done in the public interest. The appellate court reversed the superior court's ruling in favor of the homeowners, because the superior court had applied an improper legal standard "to the extent that it did not require the plaintiff (homeowners) to *prove* unreasonableness, bad faith, or abuse of power" (Rutkow, 2006, 264). Thus, on appeal, the homeowners' arguments that their homes were not being taken for public use lost on the grounds that the transfer of the property to another private entity was secondary to the public benefit of economic growth (Zax and Malcolm, 2005, 2).

The homeowners again appealed, this time to the U.S. Supreme Court. The case garnered national attention and generated more than two dozen amicus briefs from individuals and organizations supporting the homeowners (Institute for Justice, 2004). The Supreme Court focused almost exclusively on the question of whether economic development could constitute a public use (Rutkow, 2006). The Court ruled that the eminent domain exercised by the NLDC did constitute public use, by interpreting the requirement to mean public purpose, and because it benefited

the general public rather than a specific group of individuals (Rutkow, 2006, 264–265). Despite the finding that economic development activities that involve taking private property and transferring it to another private party can meet the public use requirement, the Court affirmed that the Constitution prohibits the taking of private property for the sole purpose of transferring it to another private entity, even if the just compensation requirement is met (Gallagher, 2005).

Writing for the majority, Justice Stevens stated, "… given the comprehensive character of the plan, the thorough deliberation that preceded its adoption, and the limited scope of our review, it is appropriate for us … to resolve the challenges of the individual owners, not on a piecemeal basis, but rather in light of the entire plan. Because that plan unquestionably serves a public purpose, the takings challenged here satisfy the public use requirement of the Fifth Amendment" (as cited in Morandi, 2012). Thus, the Court continued its tradition of deference to legislative bodies—including development and redevelopment authorities that had been delegated such authority—in terms of their being able to define the public interest and satisfy the public use requirement of the Constitution under an expanded interpretation of what constituted use.

Even in light of what many deemed an expansive grant of power to government with respect to the takings of private property, the Court made it explicit that nothing in the ruling precluded states and localities from placing further restrictions on the use of eminent domain.

State-Level Eminent Domain Legislation after Kelo

In leaving open the right of states and localities to restrict the use of eminent domain, the courts have left it to them to provide the framework in which it is to be used (Ackerman, 2004). The reaction to the *Kelo* decision was swift and significant, with 42 states adopting legislation or offering ballot initiatives on the use of eminent domain (Hornaday, 2007; Kelly, 2008; Salkin 2006). Ostensibly, most of these attempts were to ensure that the takings power of the state and its municipalities is not abused (Hudson, 2010). Whatever the motivations for the resulting legal framework, the fact is that, since the *Kelo* decision, a complex legal environment has developed for counties, cities, and towns looking to use eminent domain as a tool for revitalizing communities.

The National Conference of State Legislatures has analyzed these reactions to the *Kelo* decision. It identified five nonexclusive categories that describe state-level activity responding to the Supreme Court's opinion on the use of eminent domain. These categories include legislation and ballot initiatives that do the following (Morandi, 2012):

- Restrict eminent domain when the primary purpose is economic development, generate or increase tax revenues, employment, or the transfer of private property to another private party.

- Define *public use* to literally mean the possession, occupation, or use of the property by the public, public agencies, or public utilities.
- Require that eminent domain only be used in cases involving blighted properties and provide for in law what constitutes blight, with many emphasizing detriment to public health or safety.
- Require greater public notice, more public hearings, negotiation in good faith with landowners, and approval by elected governing bodies.
- Provide compensation over and above fair market value when the property is a principal residence.

Table 8.1 provides a list of state legislative and ballot initiatives that passed in response to *Kelo v. City of New London* between 2005 and 2011. The most common reaction among states was to pass legislation that prohibits the use of eminent domain for economic development purposes. Some legislation addresses this objective by focusing on prohibition of the transfer of private property to another private party, ostensibly inhibiting eminent domain for the purposes of economic development or increasing tax revenue (Patel, 2009; Salkin, 2006, 4). In a number of statutes, states made an exception for the use of eminent domain where economic development is the primary objective and the process includes a finding of blight.

Blight, a key feature of most eminent domain laws, is an amorphous term without a universally accepted definition in terms of legal finding and public policy. Before *Kelo*, a number of states expanded their definitions of blight to include any area where economic activity could be increased (Somin, 2005, 1034). Some state legislation reacting to *Kelo* did so with the aim of setting a narrow definition of what constitutes blight (Lovell, 2007).

Some states went as far as establishing requirements for quantified findings of blight. As discussed in Chapter 9 on tax increment financing, quantified blight requirements set a minimum threshold for the percentage of properties that must be classified as blighted before a governmental unit can take action through use of eminent domain or create a tax increment financing (TIF) district. For example, Iowa in 2006 enacted HB 2351, which required that eminent domain be used for redevelopment only when 75% or more of properties in the area are deemed blighted.

Much like the legislation aimed at blight, a significant percentage of the legislation enacted on the issue sought to narrowly redefine the concept of public use. In doing so, states looking to reemphasize the early judicial interpretations define it as instances where the governmental unit is taking the property for the purposes of public ownership or use.

Some legislation addressed issues regarding the process by which the power of eminent domain is exercised. Legislation taking this approach sought to restrict "the use of executive sessions for the discussion, consultation, or consideration of records involving the taking of private property for economic development," while others attempted to require that trials dealing with condemnation and eminent domain be set within 90 days and that such cases be granted precedence over all

Table 8.1 State Eminent Domain Legislation and Ballot Measures

State	*Legislation*
Alabama	SB 68 (2005) Prohibits the use of eminent domain for retail, commercial, residential, or apartment development; for purposes of generating tax revenue; or for the transfer of private property to another private party. Contains a blight exception. SB 654 (2006) Prohibits the use of eminent domain to acquire nonblighted property for a redevelopment project without the consent of the owner. Defines blighted property to emphasize characteristics that are detrimental to the public health and safety.
Alaska	HB 318 (2006) Prohibits the use of eminent domain to transfer private property to another private entity for economic development purposes.
Arkansas	Proposition 207 (2006) Limits the use of eminent domain to public uses, which are defined to include use of the land by the general public or public agencies; public utilities; to eliminate a direct threat to public health or safety caused by the property's condition; or to acquire abandoned property. Public use does not include the public benefits of economic development.
California	Proposition 99 (2008) Prohibits the use of eminent domain to acquire an owner-occupied residence to convey it to a private entity.
Colorado	HB 1411 (2006) Stipulates that a public use for which eminent domain may be exercised does not include transferring private property to another private entity for economic development purposes or to generate additional tax revenue.

(continued)

Table 8.1 State Eminent Domain Legislation and Ballot Measures (continued)

State	*Legislation*
Connecticut	SB 167 (2007) Requires a two-thirds vote of the legislative body of a municipality to approve the acquisition of real property through eminent domain by a development agency. If the municipality decides not to use the property for the purpose for which it was acquired, it must offer to sell it back to the original owners or heirs at the original purchase price or fair market value, whichever is less. Increases the level of compensation for property acquired through eminent domain by a development agency to 125% of its average appraised value. Prohibits the acquisition of real property through eminent domain if the primary purpose is to increase tax revenue.
Delaware	SB 217 (2005) Restricts the use of eminent domain by the state or a political subdivision to a recognized public use. SB 7 (2009) Limits the use of eminent domain to a "public use," which is defined to be (1) the possession, occupation, or utilization of land by the general public or by public agencies; (2) the use of land by public utilities, electric cooperatives, or common carriers; or (3) the removal of a blighted area. Public use does not include the generation of revenues or increase in tax base, tax revenues, employment or economic health, through private land owners or economic development.
Florida	HB 1567 (2006) Prohibits the transfer of private property acquired through eminent domain to another private entity with certain exceptions, including for use by common carriers, public transportation, public utilities, or where the private use is incidental to a public project. Prohibits the use of eminent domain to eliminate blight conditions or to generate additional tax revenue. Authorizes the use of eminent domain under the Community Redevelopment Act if it is necessary to remove a threat to the public health or safety.

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Table 8.1 State Eminent Domain Legislation and Ballot Measures (continued)

State	*Legislation*
Florida	HB 1569 (2006) Requires a three-fifths vote of both houses of the state legislature to approve the use of eminent domain to transfer private property to another private entity.
Georgia	HB 1313 (2006) Defines public use for which eminent domain may be exercised to be the possession, occupation, and enjoyment of property by the public, public agencies, or public utilities, or for the removal of blight. Prohibits the use of eminent domain for economic development purposes, including enhancement of the tax base or tax revenue, increased employment or improvement in the general economic health when the property is to be transferred to another private entity. Redefines blighted areas to emphasize characteristics that are detrimental to the public health and safety. Requires approval of eminent domain actions by the governing body of a city or county, and greater public notice before proceeding with condemnation authority. HR 1306 (2006) Requires approval by the elected governing body of a local government before eminent domain may be used for a redevelopment purpose. (Adopted by electorate on 2006 ballot.)
Hawaii	
Idaho	HB 555 (2006) Prohibits the use of eminent domain for a public use that is merely a pretext for transferring the property to another private entity, or for promoting economic development.

(continued)

Table 8.1 State Eminent Domain Legislation and Ballot Measures (continued)

State	*Legislation*
Illinois	SB 3086 (2006) Prohibits the use of eminent domain to confer a benefit on a particular private entity or for a public use that is merely a pretext for conferring a benefit on a particular private entity. Limits the use of eminent domain for private development unless the area is blighted and the state or local government has entered into a development agreement with a private entity.
Indiana	HB 1010 (2006) Defines public use for which eminent domain may be exercised to be the possession, occupation, and enjoyment of property by the public, public agencies, or public utilities, and does not include an increase in the tax base, tax revenue, employment, or general economic health. Redefines blighted areas to emphasize properties that are detrimental to the public health and safety. Requires payment of compensation where the property condemned is the person's primary residence at a rate equal to 150% of fair market value. Establishes a legislative study committee to study eminent domain and report its findings to the legislature no later than November 1, 2007.
Iowa	HF 2351 (2006) Defines public use for which eminent domain may be exercised to be the possession, occupation, and enjoyment of the property by the general public or a public utility; where private use is only incidental to a public use; or to redevelop blighted areas where at least 75% of the properties in the area are blighted. States that public use does not include economic development activities that generate additional tax revenue or employment, or result in private residential, commercial, or industrial development. Requires public notice before condemnation proceedings may begin. Includes a buy-back provision whereby the original owner of condemned property that is not put to a public use within five years may purchase it.

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Table 8.1 State Eminent Domain Legislation and Ballot Measures (continued)

State	*Legislation*
Kansas	SB 323 (2006) Prohibits the transfer of private property acquired through eminent domain to another private entity with certain exceptions, including property transferred to a common carrier; unsafe property acquired by a municipality; or property approved by the state legislature. The restrictions do not apply to property in a redevelopment district created prior to enactment of the law. Increases the level of compensation to landowners whose property is condemned to 200% of the average appraised value of the property.
Kentucky	HB 508 (2006) Defines public use to be ownership, possession, occupation, or enjoyment of the property by a governmental entity; removal of blighted properties; or for use by a public utility. Prohibits the transfer of private property to another private entity for economic development purposes, including enhancement of the tax base or tax revenue, increased employment or promoting the general economic health of the community.
Louisiana	SB 1 (2006) Prohibits the taking of private property predominantly for use by a private entity or to transfer ownership of the property to another private entity. Stipulates that neither economic development nor enhancement of tax revenue shall be considered in determining whether the taking of property is for a public purpose. (Adopted by electorate on 2006 ballot.) HB 707 (2006) Prohibits the sale or lease of property, with certain exceptions, that has been taken through eminent domain and held for less than 30 years unless the property is first offered to the original owner or his or her successor at fair market value. Stipulates that within one year after completion of a project for which eminent domain has been used, any surplus property must be offered to the original owner or his or her successor at fair market value. (Adopted by electorate on 2006 ballot.)

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Table 8.1 State Eminent Domain Legislation and Ballot Measures (continued)

State	*Legislation*
Maine	LD 1870 (2006) Prohibits the use of eminent domain to condemn land used for agriculture, fishing, or forestry or land improved with residential, commercial, or industrial buildings, for private retail, office, commercial, industrial, or residential purposes; primarily to generate additional tax revenue; or to transfer private property to another private entity. Provides a blight exception and use of land by a public utility.
Michigan	SJR E (2005) Stipulates that if a person's principal residence is taken for public use, the amount of just compensation shall not be less than 125% of the property's fair market value; public use does not include transferring private property to another private entity for economic development or generating additional tax revenue. (Adopted by electorate on 2006 ballot.)
Minnesota	SF 2750 (2006) Limits the use of eminent domain to a public use or public purpose, defined as the possession, occupation, ownership, or enjoyment of the property by the general public or a public agency, or for the mitigation of blight. Stipulates that the public benefits of economic development do not, by themselves, constitute a public use or public purpose. Requires good faith negotiations with property owners and increases public notice and public hearing requirements.
Mississippi	Initiative 31 (2011) Amends the Mississippi Constitution to prohibit state and local government from taking private property by eminent domain and then conveying it to other persons or private businesses for a period of 10 years after acquisition. Exceptions from the prohibition include drainage and levee facilities, roads, bridges, ports, airports, common carriers, and utilities. The prohibition would not apply in certain situations, including public nuisance, structures unfit for human habitation, or abandoned property.

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Table 8.1 State Eminent Domain Legislation and Ballot Measures (continued)

State	*Legislation*
Missouri	HB 1944 (2006) Prohibits the use of eminent domain solely for an economic development purpose, which is defined to mean an increase in the tax base, tax revenue, or employment in the area. Stipulates that eminent domain may only be used to take property in blighted areas or for a public use. Requires public notification of affected property owners before condemnation may begin, and negotiation in good faith with property owners. Establishes an Office of Ombudsman for property rights in the Office of Public Counsel in the Department of Economic Development to assist property owners in obtaining information about eminent domain.
Montana	SB 363 (2007) Limits the use of eminent domain for urban renewal purposes to property in blighted areas where the property is a detriment to the public health, safety or welfare, and prohibits its use if the primary purpose is to increase tax revenue.
Nebraska	LB 924 (2006) Prohibits the use of eminent domain primarily for economic development purposes, which is defined to mean use by a commercial entity or to increase tax revenue, the tax base, employment, or general economic conditions.
Nevada	AB 102 (2007) Stipulates that public uses for which property may be acquired through eminent domain do not include transfer of the property to another private entity. Exceptions include where the private entity uses the property primarily to benefit a public purpose; the entity leases the property to a person that occupies an incidental part of a public facility; or the property taken was abandoned by the owner, or the purpose was to abate a threat to the public health and safety.

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Table 8.1 State Eminent Domain Legislation and Ballot Measures (continued)

State	*Legislation*
Nevada	AJR 3 (2007) Stipulates that public uses for which property may be acquired through eminent domain do not include transfer of the property to another private entity. Exceptions include where the private entity uses the property primarily to benefit a public purpose; the entity leases the property to a person that occupies an incidental part of a public facility; or the property taken was abandoned by the owner or the purpose was to abate a threat to the public health and safety. (Passed again by the 2009 legislature and adopted by electorate on 2010 ballot pursuant to state law.)
New Hampshire	SB 287 (2006) Defines public use for which eminent domain may be exercised to be the possession, occupation, and enjoyment of property by the public, public agencies, or public utilities; the removal of properties that pose a threat to the public health and safety; or private uses that occupy an incidental area within a public project. Stipulates that public use does not include enhanced tax revenue and increased employment opportunities. CACR 30 (2006) Prohibits the use of eminent domain if the property is to be transferred to another private entity for private development. (Adopted by electorate on 2006 ballot.)
New Mexico	HB 393 (2007) Prohibits the use of eminent domain by municipalities for redevelopment projects under the Metropolitan Redevelopment Code.
North Carolina	HB 1965 (2006) Stipulates that eminent domain may be used only for specified public purposes contained in the statutes, which do not include economic development projects. Restricts the use of eminent domain by a redevelopment commission to blighted parcels only.

(continued)

Table 8.1 State Eminent Domain Legislation and Ballot Measures (continued)

State	*Legislation*
North Dakota	Measure 2 (2006) States that public purpose for which eminent domain may be exercised does not include public benefits of economic development, including an increase in tax base, tax revenues, employment, or general economic health. Further stipulates that private property may not be transferred to another private entity, except for common carriers or public utilities. (Adopted by electorate on 2006 ballot.) SB 2214 (2007) Prohibits the taking of private property for use or ownership by another private entity, except for common carriers or public utilities. Stipulates that public use or public purpose does not include the public benefits of economic development, including an increase in tax base, tax revenue, employment, or general economic health.
Ohio	SB 167 (2005) Places a moratorium on the use of eminent domain for economic development purposes that would ultimately result in the property being transferred to another private party in an area that is not blighted until December 31, 2006. Creates a task force to study eminent domain issues. SB 7 (2007) Stipulates that public use for which eminent domain may be exercised does not include conveyance of property to a private commercial enterprise, for economic development purposes or solely to increase tax revenue. Increases from a majority to 70% the percentage of parcels that must be blighted before an area can be designated as a blighted area, and adds a detailed definition of what constitutes a blighted parcel. Prohibits a determination that a property could generate more tax revenue as the basis for designating a parcel as blighted. Requires an agency to adopt a comprehensive plan describing the need to take property in a blighted area before exercising eminent domain and requires local legislative approval.

(continued)

Table 8.1 State Eminent Domain Legislation and Ballot Measures (continued)

State	*Legislation*
Oregon	Measure 39 (2006) Prohibits the use of eminent domain to transfer private property to another private entity. (Adopted by electorate on 2006 ballot.)
Pennsylvania	SB 881 (2006) Prohibits the use of eminent domain for private enterprise, except where the private enterprise occupies an incidental area within a public project. Does not affect the authority of the Pennsylvania Public Utility Commission, apply to the exercise of eminent domain where the property is blighted or taken pursuant to the urban redevelopment law or taken to provide low-income housing, among other considerations. Defines blight to emphasize characteristics that are detrimental to the public health and safety.
Rhode Island	SB 2728A (2008) Prohibits the use of eminent domain for economic development purposes unless the state or local government condemning property has explicit authority to do so and has adopted a plan approved by an elected governing body. The action must provide a preponderance of public benefits and only incidental benefits to a private entity. Compensation to property owners in such instances shall equal 150% of fair market value.
South Carolina	SB 1031 (2006) Prohibits the use of eminent domain for any use, including economic development that is not a public use. Authorizes the legislature to enact laws allowing eminent domain to be used to remedy blight with the property put to public or private use provided just compensation is paid. (Adopted by electorate on 2006 ballot.)

(continued)

Table 8.1 State Eminent Domain Legislation and Ballot Measures (continued)

State	*Legislation*
South Carolina	SB 155 (2007) Ratifies the provisions contained in Constitutional Amendment 5, passed on the 2006 ballot, that prohibits the use of eminent domain for any use, including economic development, that is not a public use, and that authorizes the legislature to enact laws allowing eminent domain to be used to remedy blight with the property put to public or private use provided just compensation is paid.
South Dakota	HB 1080 (2006) Prohibits the use of eminent domain to transfer private property to another private entity or to be used primarily to generate additional tax revenue.
Tennessee	SB 3296 (2006) Stipulates that public use for which eminent domain may be exercised does not include private use or benefit, or public benefit resulting indirectly from private economic development, including increased tax revenue and employment. Exceptions include use of eminent domain by public or private utilities, housing authorities, or community development agencies to remove blight, private use that is merely incidental to public use, or the acquisition of property by a local government for an industrial park.
Texas	SB 7 (2005) Prohibits the use of eminent domain to confer a private benefit on a private party or for economic development purposes, with certain exceptions.
Utah	SB 317 (2006) Requires approval by the governing body of a local government before eminent domain may be exercised for a public use. Requires a written notice to be sent to the affected landowner at least 10 days prior to the public hearing where the proposed taking will be considered. Expands the definition of public use to include bicycle paths and sidewalks adjacent to paved roads, while limiting the use of eminent domain for certain recreational purposes.

(continued)

Table 8.1 State Eminent Domain Legislation and Ballot Measures (continued)

State	*Legislation*
Utah	HB 365 (2007) Prohibits the use of eminent domain to acquire single-family residential owner-occupied property unless requested by the owners of at least 80% of the owner occupied property within the area representing at least 70% of the value of owner occupied property in the area, and two-thirds of all agency board members approve of the acquisition. For the acquisition of commercial property, the figures are 75% and 60%, respectively. Authorizes the use of eminent domain in an urban renewal project area if an agency determines the property is blighted, the urban renewal project area plan provides for the use of eminent domain and acquisition of the property begins no later than five years after the date of the plan. Requires advance written notice and good faith negotiations with property owners before exercising eminent domain.
Vermont	SB 246 (2006) Prohibits the use of eminent domain primarily for economic development purposes, except in accordance with the state's urban renewal law. Other exceptions include uses for transportation, public utilities, public property, and water projects.
Virginia	SB 781, SB 1296, HB 2954 (2007) Defines public use for which eminent domain may be exercised to be, among other uses, the possession, ownership, occupation, and enjoyment of property by the public or a public corporation, or for the removal of blight where the property condemned is actually blighted. Stipulates that property may only be taken where the public interest dominates any private gain and the primary purpose is not for an increase in tax base, tax revenue, or employment.

(continued)

Table 8.1 State Eminent Domain Legislation and Ballot Measures (continued)

State	*Legislation*
Virginia	HJR 693 (2011) Prohibits the use of eminent domain if the primary purpose is to benefit a private entity, increase jobs, increase tax revenue, or for economic development. Includes lost profits and lost access to property in the definition of just compensation. Requires the government condemning the property to prove that its action is for a public use. (Must pass the General Assembly again during the 2012 session before being submitted to the electorate on the 2012 ballot.)
West Virginia	HB 4048 (2006) Prohibits the use of eminent domain primarily for private economic development. Contains a blight exception and redefines blighted areas to emphasize properties that are detrimental to the public health and safety. Requires greater public notice and negotiation in good faith with the property owner.
Wisconsin	AB 657 (2006) Prohibits the use of eminent domain to condemn nonblighted properties to be transferred to another private entity. Redefines blight to emphasize properties that are detrimental to the public health and safety.
Wyoming	HB 124 (2007) Defines public purpose for which eminent domain may be exercised to be the possession, occupation, and enjoyment of property by a public entity. Prohibits the transfer of private property to another private entity except to protect the public health and safety. Prohibits a municipality from delegating eminent domain authority to an urban renewal agency. Requires advance written notice and good faith negotiations with property owners before exercising eminent domain.

Source: National Conference of State Legislatures. 2012. With permission.

other civil cases (Salkin, 2006, 5). Most of the legislation offered in response to *Kelo* was not enacted into law. However, the variation that exists among states indicates to public administrators and nonprofit managers that engaging in the eminent domain processes require an understanding of the legal framework to ensure that every action taken is legal.

Municipal Ordinances and Eminent Domain

Adding to the legal complexities of eminent domain, municipalities have crafted their own laws regarding its use. The form and function of municipal ordinances closely mirror that of state legislation. A number of these were ballot initiatives, e.g., 76% of voters in Orange County, California, approved of a measure that prohibits the county from using eminent domain for private economic development, and 78% of voters in DeBary, Florida, voted in favor of amending the city's charter to exclude takings for private development (Castle Coalition, 2012).

Examples of county and municipal ordinances passed in the wake of the *Kelo* decision are endless. They indicate that eminent domain does not enjoy popular support, especially when used for economic development. However, local government officials should remember that both state and municipal legislation routinely provides for blight exceptions. These are cases where use of eminent domain is most likely to enjoy the support of both elected officials and the public.

Just Compensation: The Other Constitutional Requirement

The other significant legal condition associated with the use of eminent domain is the Fifth Amendment's requirement that just compensation be paid to owners whose property has been taken (Turnbull, 2010). Because *just compensation* is not defined in the Constitution, courts have been left with the responsibility of determining what it means. While many times the issue of compensation is settled outside the courtroom, there are a number of cases that have resulted in a legal framework by which courts have interpreted the just compensation requirement of the Constitution. The predominant judicial interpretation has been that the term is meant to mean the fair-market value of the property (Stokes, 2006). In more specific terms, this is the price that a seller and buyer would agree on if the property were being sold in a normal transaction (McKirdy, 2007, 1).

Courts have used a variety of valuation methods in determining the fair-market value of property. As outlined in Figure 8.1, there are four common approaches to valuing property during eminent domain proceedings. In each, the central goal is to provide property owners with sufficient compensation to make them whole for the loss of their property. The first approach seeks to provide individuals with

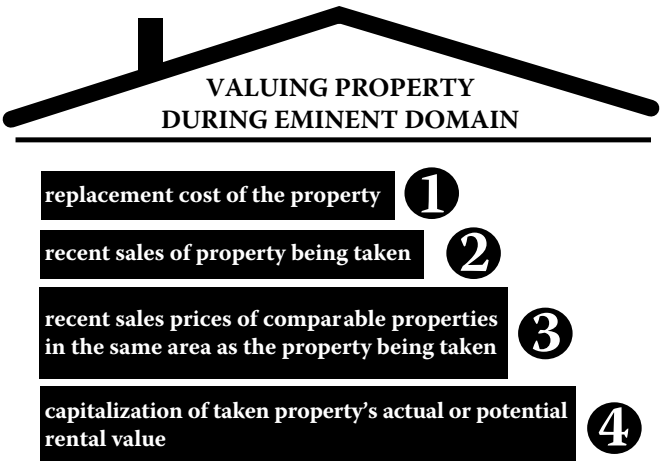

Figure 8.1 Just compensation approaches. (From Williams, M. 2009. *The Urban Lawyer* 41: 183–216. With permission.)

compensation that would allow them to purchase a similar property elsewhere. Options two and three use the sale prices as indicators of the property's value for compensation purposes. Option two leverages the most recent sales price of the property taken. This may be insufficient as the owner may not have recently acquired the property and the sales price is not reflective of the current market. Alternatively, courts have used option three in such cases to identify what the current market would yield the owner for the property and establish that as just compensation. Lastly, courts have examined a property's actual or potential value in terms of generating income through rents and using it as a guideline for setting the value of a property.

In the wake of *Kelo*, however, there has been a movement to better define or constrain judicial interpretation of the issue of compensation. The state of Michigan, for example, amended its constitution to require that when a property owner's principal residence is acquired via eminent domain, the owner be paid at least 125% of fair market value, in addition to any other allowable compensation. Indiana, Kansas, and Missouri also have passed laws requiring 125% of fair market compensation in specific cases (Chang, 2010, 201).

Valuation of Contaminated Properties

The just compensation requirement is even more difficult to determine in instances of properties that are environmentally contaminated and need remediation. The difficulty lies in determining the level of contamination and the cost of any resulting cleanup. Negotiations between buyers and sellers in these instances generally

depreciate the property's value to account for the needed remediation (Olson and Pelle, 2009). If the valuation issue goes to court, then the task of deciding on a figure that meets the just compensation requirement becomes a multifarious process that includes a number of considerations.

The overarching question for states and courts has been whether the presence of environmental contamination should be considered when deciding the fair market value of a property (Hollister and McKeen, 2005). For example, if the court decides that a jury can consider the current state of the property, including any contamination, and sets a price with that consideration in mind, the property owners could be penalized twice if they also are held responsible for paying for related cleanup out of the compensation. Given the uncertainties associated with the cost of remediating such properties, courts have generally sought to do the following in these cases (Opper, 2005, 22):

- Preserve the owner's right to be fully compensated for what he or she may have lost
- Provide that the owner's remedial obligations, if any, are addressed fairly, sometimes using escrows and other tools to isolate decisions about liability for remedial costs from the valuation trial
- Ensure that the owner does not bear a double burden of both the remedial cost and a depressed valuation as a result of current conditions.

A universal agreement does not exist among states and courts about how to address the issue of contaminated property valuation (Boulris, 1995). The Supreme Courts of Connecticut and Michigan ruled to allow contamination and remediation costs to be considered when determining a property's actual value. In contrast, the Supreme Court of New York and the appellate court of New Jersey ruled to consider the level of contamination and determine what the property's value would be if it were cleaned up. Then a court can escrow the cost of environmental remediation separately (Stokes, 2006, 225).

Connecticut case law also provides a point of interest in terms of valuation of contaminated properties. In the case of *Northeast Connecticut Economic Alliance, Inc. v. ATC Partnership*, the trial court ruled, with the Connecticut Supreme Court affirming, that because the redevelopment partnership had secured grants and third-party contributions to cover 80% of remediation costs, those costs should be included in the fair-market value of the property and offset any reductions caused by the contamination (Hysell, 2005). Thus, localities should be aware that funds used to assist in the remediation of these properties could impact the extent to which the contamination can affect the valuation of the property. This, however, is dependent on the court in which the case is heard.

Eminent Domain, Economic Development, and Environmental Remediation

The intersection of eminent domain, economic development, and environmental remediation is common in America's urban areas (Levine and Synk, 2005, 37). America's industrial graveyards are replete with brownfields and its suburban landscape is dotted with grayfields (see Chapter 2 for more information on brownfields and grayfields). Whether gray or brown, these properties are going underused or completely unused and are not generating the revenue they could (Carpenter and Ross, 2010). In many of these cases, properties have been "mothballed" (or left inactive and not for sale) because owners do not want to pay for remediation or risk exposure to potential legal liability. Thus, a locality may need to use eminent domain to begin the process of revitalizing an area by addressing the most significant issue holding the area back in terms of developer interest: contamination and the cost and liability associated with cleanup.

In some of these areas, only specific parcels may be contaminated rather than all of the properties. In these instances, the presence and proximity of the contaminated properties can inhibit an area's development. This can occur for two main reasons. First, the contaminated property may be of sufficient size to decrease the amount of available land needed for a project where a developer is not interested in taking on the process of remediation. Second, developers may not want to take on the cost associated with cleanup. Many developers do not want to purchase contaminated properties, even when the price of the property reflects the presence of pollutants.

As discussed in the Chapter 2, one option may be to engage in land assembly. Land assembly is a process whereby a locality combines a number of parcels to minimize the remediation cost as a percentage of a project's overall cost (International Economic Development Council, 2006). This process may or may not involve eminent domain, but it has proved useful for some municipalities. For example, the City of Sandusky, Ohio, assembled land in its Paper District. The combination of five parcels of land created a site that was attractive to developers and minimized the costs of remediation as a percentage of total project costs (Opp and Osgood, 2011, 7). Whether or not the properties assembled were acquired voluntarily, the assembly of contaminated and noncontaminated properties helps to decrease the percentage of a project that is devoted to remediation.

Local governments can play an important role in addressing contaminated and mothballed areas, but administrators should be aware of several challenges (Paull, 2008, 5). First, many localities are concerned about the liability associated with assuming possession of contaminated properties. In some states, such as like Connecticut, Illinois, Maryland, California, and Virginia, public agencies have adopted liability protections that defend them against legal action related to their ownership of contaminated properties (Paull, 2008, 5).

Another issue is the complex process of attempting to value contaminated properties. There are two pieces to this particular problem. The first is that in some states, localities do not have clear authority to gain access to sites to perform analysis of the extent of the contamination before taking possession. For localities in these states, the costs associated with the needed remediation may add so much uncertainty to the project that they simply choose not to exercise eminent domain for fear of that the costs may outweigh the benefits. Some localities, in states like Connecticut, Illinois, and California, do have the authority to access the property before taking on ownership (Paull, 2008, 5).

The second piece of this problem is deduction of remediation costs from the fair-market value of the property. Two possibilities exist for localities when addressing the issue of contamination and valuation. Some localities, given both local ordinances and case law, may be able to consider the degraded state of the property when setting a fair-market value. In other places, however, localities are required to separate the issues of determining a property's value and the cost of remediation. In the latter instance, localities may be required to place the fair-market value of a property in escrow and draw down from that account the costs associated with cleanup (Opper, 2005, 25).

Last are issues of enforcement and cost recovery, which localities rarely have the authority to pursue. Illinois has, for example, provided enforcement powers to localities via tax lien and foreclosure processes; Wisconsin allows localities to seek cost recovery in eminent domain proceedings. In regard to cost recovery, little in the way of case law has developed around the issue of the value of the property exceeding the recovery costs. Thus, localities in states without cost-recovery mechanisms need to ensure that there are plans for seeking federal and state grants or they have the funds in their budgets for covering costs in excess of the value of the property.

Conclusions and Concepts in Action: San Diego, California

Eminent domain continues to be a volatile issue, but public administrators and nonprofit managers may find themselves in situations where its use is dictated. Given the finality and seriousness of the act of taking an owner's property without consent, eminent domain should be a tool of last resort (Barton and Proakis, 2005). Local government officials also should be sensitive to the Supreme Court's decision regarding *Kelo v. City of New London*. The Court's opinion referenced a comprehensive and thorough deliberation that occurred in the planning related to the process used to exercise eminent domain in this area. In this regard, any process using eminent domain must include community input and participation in the decision-making process.

In times where the needs of the community and the environment dictate that municipalities seek the acquisition of property via eminent domain, two questions should be considered (Opper, 2005, 28):

1. What are the applicable federal, state, and local laws, including federal and state constitutions and municipal charters, that dictate the use of eminent domain?
2. What does current state and local law, including relevant case law, say on the issue of valuing the property with regard to including or excluding the expected costs of cleanup or the impact of the contamination on that value?

In the case study that follows, these questions are considered in the context of the redevelopment of a contaminated property in San Diego, California. Perhaps most instructive for public administrators and nonprofit managers is the paradigm shift or change in perspective that the regulators in this case experienced. Instead of viewing themselves as enforcers, the regulators shifted their roles to one of individuals with the necessary expertise to provide the project with assistance. Thus, while localities often find themselves with enforcement responsibilities, they can leverage those areas of responsibility to assist in finding common ground between environmental protection and economic development.

SAN DIEGO'S MAJOR LEAGUE BALLPARK DISTRICT

Successful redevelopment is difficult; it is not enough to adopt an "if you build it, they will come" attitude when it comes to achieving true community revitalization. The logistics and legal issues can be complex. Timing of multiple calendars is often a critical and thorny component. Of course, it stands to reason that the more ambitious the project's goals, the more complicated it is to bring it to fruition.

The most sought-after type of redevelopment is the catalyst project, which is designed so that some degree of public investment spurs a great deal more in private investment. The most successful catalyst projects are radical game changers, paving the way for private investment many times over. Such projects are pursued in the hopes they can cause rebirth of entire blocks or even communities—a goal worthy of pursuit, but one that is difficult to achieve. There are many practical challenges involved: coordinating a project's construction calendar and entry into the marketplace while attempting to synchronize the multifaceted processes of land acquisition, environmental assessment, and remediation of environmental conditions. This tightrope act requires coordinating political calendars and public meetings with court calendars, filing deadlines, regulatory agencies' schedules, and unexpected setbacks.

This case study presents the story of a catalyst project in San Diego that overcame those challenges and transformed a neighborhood. The project survived due to the political will of leaders who exercised eminent domain and identified public financing to encourage private investment. It involved acquisition of more than 100 property parcels, ranging from abstract interests in public rights-of-way to those belonging to powerful conglomerates. Despite those challenges, San Diego's Ballpark District came to be the lynchpin of one of the most successful redevelopment undertakings in the city's history. The reader should be cautioned that since the writing of this case study, the redevelopment law of California has been dramatically changed, but the circumstances that made this project work still provide valuable lessons for the successful redevelopment of contaminated property.

Acquisition of Contaminated Land

The exercise of eminent domain is complicated enough without the complexity of dealing with contaminated properties. Even cities that are bold about using their takings power find that it is only the first challenge to a successful project. Even when executed cautiously and properly, eminent domain does not always spark property or community revitalization, and it cannot instantly solve the problem of what to do with environmentally contaminated properties.

When revitalization of contaminated properties is the goal, governments must take creative steps to complement eminent domain efforts. One option is to leverage a state's redevelopment power. While states' laws vary on this front, many have redevelopment laws for the purpose of combating community blight. These laws can offer governments an opportunity to make significant change.

One example of how this opportunity can be successfully harnessed is San Diego's Ballpark District. Through careful exercise of its eminent domain and redevelopment powers, the City of San Diego was able to transform a neighborhood from an obsolete downtown industrial waterfront to a bustling, multiuse hub of local and tourist activity.

If the lone implement in San Diego's toolbox had been the power of eminent domain, it could not have completed a project of this scale and vision. Similarly, if San Diego had only its redevelopment laws on which to rely, the project would have languished. Only by using these two powers in concert was the government was able to facilitate such a wholesale neighborhood reinvigoration.

Project Scope and Challenges

Creation of the San Diego Padres' Petco Park Ballpark District was a massive undertaking. Previously, the Padres had been playing in a facility they shared with the Chargers, San Diego's National Football League team. However, the Padres were seeking a new home due to the deteriorating condition of the stadium and a lease structure that favored the Chargers as the primary tenant. At the same time, the city was saddled with a tract of underperforming industrial land adjacent to a prime downtown location. Facing the possibility that the team would relocate, the city found the idea of a new stadium downtown to be attractive. Still, the proposal teemed with challenges that seemed insurmountable.

First, the land considered for the ballpark consisted of more than 100 individual parcels. The parcels' owners each possessed a different level of knowledge regarding property transactions and a different degree of enthusiasm for the project. Owners ranged from utility giant San Diego Gas & Electric (with a corporate agenda and its own bureaucratic structure) to mom-and-pop small business operators to whom the city would need to offer a great degree of education on the process. Without the power of eminent domain, one holdout owner could have demanded astronomical prices once it caught wind of the city's intentions for the land. Even with the use of eminent domain, the process of negotiating with each owner and carrying out eminent domain proceedings required a coordinated effort.

To compound the problem, many of the parcels were environmentally contaminated. Some properties required full-scale testing and excavation of heavily contaminated soil. This excavation had the potential for delays and costs high enough such that discovery of contamination could have derailed the project had it proceeded in a traditional parcel-by-parcel manner, even assuming that all the land acquisition issues had been resolved.

Environmental contamination also complicated property valuation in the eminent domain actions. Although there were some prior court decisions from disputes discussing valuation in eminent domain proceedings for contaminated land, neither statutes nor case law provided much direction as to how such valuation should be considered in California in the context of actions involving brownfields. Nothing like it had ever been done in California, and there was limited precedent elsewhere in the country. Wading into these murky waters was risky, especially to city leaders under public scrutiny for their role in this high-profile project.

Committed to exploring all options to keep the Major League Baseball franchise in town, the city entered into an unprecedented arrangement. It called for coordination among the Padres, the city, the county's environmental

regulators, the city's local redevelopment agency, and a private developer. A key to the city's success was its decision to exercise its eminent domain and redevelopment powers in concert to assemble the parcels and remediate the contamination.

Eminent domain, while a powerful mechanism, would not have been sufficient on its own. To that end, public agencies in California are fortunate to have special legislation to address blighted properties: the Polanco Redevelopment Act. Polanco is a state statute that empowers California's public redevelopment agencies to address contaminated properties in a way that can enhance the redevelopment process. Polanco allows agencies to perform cleanup actions and obtain reimbursement from responsible parties, and its use was integral to the ballpark project's success.

Contamination, Redevelopment, and CERCLA

Because many urban areas contain land formerly used for industrial purposes, it is common to encounter contaminated properties in these areas. Most urban infill redevelopment is impacted by chemicals that are part of the modern world. Sometimes properties are contaminated because they have leaking underground gasoline storage tanks (USTs) or because a former use on the site (e.g., by a metal works, plating business, dry cleaner, or automotive shop) caused seepage of chemicals into the soil or groundwater. These issues must be addressed before the property can be developed and improved, and the impact on just compensation in eminent domain proceedings can be complex.

Environmental cleanup is no small task. It often includes assessment costs, soil and groundwater sampling, lab analysis, excavation, treatment, removal of soil, and ongoing monitoring obligations. Cleanup can be so expensive that private developers cannot afford to take on these projects once they factor in the cost. For these reasons, responsibility for environmental issues can be a legal liability that developers are often not willing to assume.

Environmental contamination can expose property developers to liability for the effects of the contamination—both with respect to the property and offsite—in the event that it is found that the contamination has migrated. This is an issue in part because Congress passed the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, also known as the Superfund program) in 1980, with the goal of protecting the environment from hazardous substances. Among a host of other provisions, CERCLA offers guidance as to how to determine who is legally responsible for contamination. Being an owner of such a site is often all that is needed.

CERCLA is widely considered to be effective with respect to galvanizing parties into action to perform removal and remediation of contamination. Nevertheless, the law of unintended consequences was powerful with the Superfund. CERCLA's liability scheme (and the manner in which courts have interpreted it) is very strict. Judges have determined that CERCLA's liability is "joint and several:" If a party is deemed responsible for even a small portion of the contamination, it can be responsible for the cleanup of the entire mess. Furthermore, when one party contends that there is someone else who should bear greater responsibility, the first party is often left to pursue the other party at its own expense and risk.

CERCLA's liability provisions are so strict that, in practice, it caused corporations to hold on to property because purchasers were not willing to take on the risks associated with contaminated properties, and the government could ignore risk-transfer agreements if it chose to. Even when a corporation tried to negotiate with a buyer for a risk transfer, CERCLA allowed the government to proceed against the entity that allowed the original "release" to occur. This discouraged corporate sellers and potential buyers and developers. As a result, some properties were mothballed. This land often sat vacant or dilapidated, becoming an eyesore in the community. Although this could not be the result Congress intended, it was and is a pervasive problem.

The U.S. Council of Mayors pushed this issue with Congress, leading the charge for amendments to CERCLA, but proposals seeking changes were held up given serious disagreements among the parties on how best to address issue. Despite having been originally scheduled for a September 11, 2001 vote, Congress passed the bill later that year to demonstrate a renewed sense of bipartisanship, which resulted in the 2011 brownfield amendments to CERCLA.

California's Polanco Redevelopment Act

California legislators had noticed the problem of mothballed properties years earlier, and the state legislature adopted a different approach to trying to free these captive lands. In 1991, a decade before the CERCLA amendments, the state legislature provided that redevelopment agencies could acquire lands, but maintain immunity from liability under state law. Redevelopment agencies were provided a clear legal path to recover the costs of cleanup. This law is called the Polanco Redevelopment Act.

Polanco helps redevelopment agencies in California address the issue of contamination by allowing them to assure that properties are cleaned up by the responsible parties. Thus, it frees those properties for new uses. Polanco allows an agency to organize a cleanup suitable for a redeveloped use and

provides that the responsible persons must reimburse the agency for its efforts. Before Polanco, project proponents would have had to rely on common law theories in untested waters, all the while losing time, money, and likely interest in the project. Polanco allows an agency to do all this at a streamlined pace and, thus, to create properties that are more suitable for development and more attractive to private developers.

Specifically, Polanco provides that "responsible parties" and "dischargers" (as defined by state and federal law) are responsible to agencies for certain costs. They are responsible for costs related to environmental contamination of properties by releases of hazardous substances if those properties are located in redevelopment project areas. Alternatively, agencies can compel the responsible parties to perform the cleanup by seeking a court order, but there are practical limitations to this approach. The main drawback is that leaving the responsible party in charge of cleanup cedes control to a third party in circumstances where time and coordination may be critical. There is the further risk that the party may have neither the expertise nor the desire to lead such an effort. The agency, which is sometimes better versed in hazardous substance investigation and remediation and better equipped to address such issues, may be more effective at implementing a plan, even if it has to incur the up-front costs.

Ironically, the new CERCLA amendments have created more challenges for a redevelopment agency using Polanco. In examining whether the defendant meets Polanco's definition of a responsible party, the agency must consider whether there are any ways in which the current owner may take advantage of CERCLA's new exceptions to liability. Polanco adopts the same rules as CERCLA, and this means that an otherwise responsible party may nevertheless be deemed not liable if it can prove it is subject to one of the following CERCLA defenses: the third party defense, the innocent landowner defense, the bona fide prospective purchaser defense, or the contiguous property owner defense. Experience with these defenses and Polanco actions is limited, and there is a dearth of case law on the issues. In what is now viewed as the tumultuous world of California redevelopment law, only time and judicial decisions will sort out how liability is ultimately resolved when contaminated property is needed for a public project.

Acquisition and Remediation for San Diego's Ballpark Project

There is no better example of how the Polanco Redevelopment Act works as a complement to eminent domain than the San Diego Ballpark Project. The city and the local redevelopment agency used Polanco to assemble a tract of land to accommodate the project and to remediate the contamination

on each individual parcel. Using Polanco expedited this process and helped make the project possible.

With the permission of the California Environmental Protection Agency (Cal EPA), the County of San Diego Department of Environmental Health (DEH) served as the lead regulatory agency for the project. The selection of the DEH—a local oversight agency, as contrasted with a state agency—was practical, because the location of its offices was right next door to the project. Local control of the project was crucial, as DEH enjoyed the greatest familiarity with the site, ensured its staff was accessible, and was vested in the project due to its importance to the community. Some of the regulators were also baseball fans. This shared vision and purpose was valuable to the success of the enterprise.

DEH, which was encouraged by Cal EPA to be creative and flexible, worked closely with the project's environmental team. Under a meticulously negotiated and unique arrangement with DEH, an environmental consultant working with the redevelopment agency prepared a master work plan for the entire parcel area. The work plan provided risk-based cleanup levels based on the planned use of the property so that work could be prioritized.

As part of that plan, the consultant identified known and suspected releases of hazardous substances in a Phase I Environmental Site Assessment that covered a 35-block area. The assessment evaluated regional issues and honed in on specifics where concerns were indicated (e.g., in the historic Western Metal Supply Building, where blacksmith operations were conducted 150 years ago). The agency provided individual property owners with the initial cleanup plans. Of all the parcels, only one property owner opted to implement cleanup, the rest was handled by the public agency.

This scale of cleanup was unprecedented in San Diego. The environmental consultant used new technology to assess soils using a mobile laboratory and employed other cost- and time-saving measures. The consultant assessed more than 100 underground storage tank sites and removed at least 27 of them. More than 38 releases of gasoline, diesel, waste oil, and fuel oil were identified. Recycled battery plants, ammonia-fueled refrigeration plants, ancient redwood oil pipelines, and blacksmith forges were all in the footprint.

Aside from the technical and legal efficiencies that were employed to make this effort successful, there was another important factor at play: the cooperative spirit shared by participants. It was clear that elected officials, city and agency decision makers, and governmental regulators had embarked on the pursuit of a common goal. With that shared vision, it was easier to identify and execute opportunities for collaboration and efficiency. The existence of strong political leadership and community support for the project made it possible to view the normal regulatory and technical processes through a

different lens, resulting in a novel and more effective approach. This reflected a "paradigm shift" that was beginning in California around this time. Regulators were starting to consider how they could help and assist a project, rather than view them all as "enforcement matters." When the lens is one of "enforcement," the considerations about cost and efficiency are often overlooked even though the endpoint—a protective cleanup—is the shared goal.

In addition, it took a creative and coordinated approach to address the challenges of handling multiple lawsuits. Coordination of court calendars related to the eminent domain and cost recovery actions was essential. Although not every state allows eminent domain proceedings to be carried out alongside cost-recovery actions, and some states even require them to be filed in different courts, the city was able file its eminent domain and Polanco cost recovery actions together. Doing so created judicial and practical efficiencies and helped ensure fairness by having the same judge be knowledgeable about all related issues.

Having the claims heard together was important for another reason. The city was successful in convincing the court to allow the withholding of a conservative amount of funds to account for the cost of cleanup, which at that time had not been ascertained. If this had not been allowed, the city would have had to wait for payment until the costs could be determined with certainty, which would have translated into a significant delay. Instead, the city used the Polanco Act as justification to allow it to keep the funds withheld from the eminent domain deposits in an escrow account under the city's control, which was subject to an agreement that the city would disburse only the funds necessary to complete the work required by the regulators and that it would refund any unspent funds to the landowners.

The parties agreed to this arrangement because it was negotiated in the spirit of arriving at a resolution rather than continuing to rack up litigation costs. In that respect, Polanco's provision, which allows the agency to recover attorneys' fees, also helped the parties reach settlements that avoided significant litigation cost and risk. This factor motivated the property owners to negotiate rather than endlessly litigate the issues.

Sustainability at Petco Park

This project incorporated many principles of sustainable development. The ballpark facility recycles 44% of its waste stream. It enacted stringent stormwater management controls; trash and debris from the parking lot are diverted from the storm drain system. Also, the park is outfitted with a first-flush system that captures the first rain of a storm (which tends to pick up most of the oils, debris, and contaminants from the ground) and diverts it

to the sewer system for treatment. Furthermore, developers built a cooling plant as part of the project. The cooling plant provides energy-efficient cooling using chilled water, with nearly no greenhouse gas emissions. The Padres organization has committed to using only nontoxic products in the maintenance of the park and its grounds.

The siting of the project was itself a reflection of sustainable planning principles. It is located in an urban core and is served by all major forms of transit. Three bus lines stop directly at the park entrance, four more have stops two blocks away, and several others serve the surrounding neighborhood. There are two trolley and light rail line stations within two blocks, and ferry and water taxi services are available for those traveling from nearby Coronado Island. Visitors from North San Diego County can take a train into downtown's main station and either walk to the park or connect to a trolley line. Amtrak trains also serve that station and are useful for fans traveling from points farther north.

The development surrounding the project incorporates mixed-use planning concepts, with many buildings offering office or residential space above street-level retail. This mix is designed to give residents more viable local options so that they might be able to live, work, and find entertainment without having to drive their cars. This setup has created a vibrant retail and restaurant scene in the neighborhood that is popular year-round and is especially lively on game days.

Effects on the Neighborhood: The Ballpark District Concept

The neighborhood in which Petco Park site is located—San Diego's East Village—formerly included many blighted properties. It was considered to be an unsafe area, was economically depressed, and was chronically underutilized. Despite its location near the waterfront and the downtown core, it was largely a warehouse district, with more than 70% of the land vacant or used for surface parking or storage.

Taking a lesson from Houston and Los Angeles, where new stadium projects failed to produce development in the adjacent areas for years, San Diego wanted development in the vicinity of the stadium to occur concurrent with its construction. Thus, the idea for a new stadium expanded to include the concept of the Ballpark District.

The city entered into an agreement to finance the ballpark with a real estate company founded by the owner of the Padres. The city's ownership share was 70%, and the developer's was 30%. Consistent with that percentage split, the city was responsible for coming up with $186 million for the park, and the Padres and the private developer were responsible for $81 million in funding.

The agreement made the city and other local public agencies responsible for approximately 75% of the land acquisition and infrastructure costs, with the team and the developer willing to pick up the rest. The total cost for the park portion of the project was $411 million.

A significant provision of the agreement was that the developer was responsible for developing a minimum of $311 million in projects in the neighboring area. This was the first time a stadium project and redevelopment of an area surrounding the project had been contractually tied together. In 1998, San Diego voted by initiative to approve the arrangement.

At the time that the ballot measure was presented to voters, it was projected that the project would inspire $1 billion in private investments over a 10-year period. In fact, that goal was reached much quicker than any of the earlier estimates. As of 2011, the project had created more than $2 billion in redevelopment activity in the vicinity of the park, including hotels, condominiums, retail, office space, and parking structures. The development of the East Village gave San Diego a significant source of property, sales, and tourism tax revenue in an area that had previously been a tax drain.

Lessons Learned

In light of the national political backlash after *Kelo*, governments became wary of wielding their eminent domain authority. A worldwide recession followed on the heels of this new and more timid environment for public agency action, slowing ambitious projects to an even greater degree. However, that changed recently in California. The state's budget has been structurally imbalanced for years, and Governor Jerry Brown saw the redevelopment agencies as an area he could use to help close the budget gap. Legislation was passed and survived challenge in the state's Supreme Court in 2011, and as of February 1, 2012, there are no longer redevelopment agencies in the state. All of the funding and assets of the agencies will go to the entities who would have received the tax income had there been no redevelopment. Nonetheless, the Polanco Act continues to be used by those entities that the Legislature substituted for redevelopment agencies, now called *successor agencies*. In addition, there is now consideration of letting municipalities wield these same powers as exercised by the redevelopment agencies.

Is redevelopment a victim of its own success? Perhaps to some degree, but over the half-century that redevelopment agencies have tried to fight blight, not all projects have been successful. Some projects were ill-designed and have failed, and some seemed to be back-room deals between politicos and their well-heeled developer supporters. Given the public's loss of support for

the use of the tools that redevelopment requires, it is not surprising that the agencies became targets to a revenue-deficient state government.

Ambitious, game-changing projects are complex and risky. The Ballpark District project tested the stamina of its owner-developer, who faced litigation as soon as the first structural members were built. For more than a year, the site looked like Stonehenge, with hulking concrete structures holding nothing up. Construction was halted during litigation. Now, however, most San Diegans marvel at how the district has changed the downtown for the better.

It remains to be seen how the elimination of the redevelopment agency will change California's political and built landscape. Regardless, it is possible to draw lessons from the Petco Park experience. One of clearest lessons is that political leadership is essential. Leadership that communicates a vision and garners the needed support for it, and then stays with the vision through the inevitable ups and downs of the process, is critical to success. While unanimity is rewarding, it is seldom achieved. Reaching out to detractors in a transparent way and communicating the options and why decisions are being made is the best strategy for building consensus. Frequently, the teams that assemble to build a major project mistakenly think of the core group as the extent of the team. One lesson to share is that project teams include both proponents and opponents, as well as plenty of people who consider themselves neutral. By reaching out to opponents and bringing them into the project early, localities can be aware of the issues from the beginning.

Redevelopment powers can be very effective when exercised judiciously. In the case of San Diego's Petco Park, the ability to use the Polanco Act was an essential ingredient to the project's success. Other ingredients of that success should not be overlooked, however. The shared vision of a downtown ballpark was enough to bring those who were initially opposed close enough to those who were enthusiastic supporters, and even those who thought themselves neutral were swept into the excitement of the project. This can-do attitude and consensus-based approach to problem solving is hard to imagine in California's volatile political climate, but the project is an example of how a flexible and open-minded approach can foster significant progress. Collaboration, consensus, and creativity can go a long way to effect positive change in a local community.

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Chapter 9

Tax Increment Financing for Sustainable Economic Development

Public administrators and nonprofit managers have turned to tax increment financing more than any other approach when financing economic development (Briffault, 2010, 65). Tax increment financing (TIF) districts are used to direct development or redevelopment toward specific geographic areas, especially those that are blighted or environmentally contaminated (Man, 2001a, 1). Initially introduced in California during 1951, these financing arrangements have increased in popularity due in large part to a reduction in federal aid, urban decline (especially in areas with strong ties to the industrial past), and a growing hostility among the electorate toward tax increases (Johnson and Kriz, 2001, 31; Man, 1999).

Municipalities are authorized to create TIF districts in 49 U.S. states and the District of Columbia. Arizona is the only state whose municipalities, for constitutional reasons, are unable to leverage this prevalent economic development tool (Iams, 2006). Even though TIF districts were initially designed to address blighted or decaying areas, they have since become a general economic development tool. Whereas traditional TIF projects were enacted specifically in blighted areas, only half of the states that have passed TIF legislation since 1980 have included this type of requirement (Byrne, 2010, 15).

This chapter offers public administrators and nonprofit managers a broad overview of tax increment financing. It begins with a discussion of TIF and the key questions to consider when exploring it as a policy vehicle, including the importance

of analysis, private sector considerations, and political considerations. Then, it discusses the statutory framework that exists in the United States in terms of state restrictions and requirements for enacting TIF. After reviewing the technical and legal contexts, the discussion turns to examples of localities using TIF to pursue environmentally conscious economic development. The chapter closes with a case study from Fort Worth, Texas, illustrating how the city successfully used a TIF district to find common ground between economic development and sustainability.

What Is Tax Increment Financing?

Tax increment financing is a political and administrative process by which a municipality places an artificial tax boundary or district around a parcel of property slated for development or redevelopment (Huddleston, 1981, 374). Depending upon state legislation, TIF activities can be directed by either the municipality or an economic or redevelopment agency that is authorized by the municipality (Youngman, 2011). The year in which the district is established is referred to as the *base year*, and the value of the property within that boundary or district becomes the *base assessed value.*

After the initial property has been valued, the municipality or authority established to manage the district begins the process of development or redevelopment, which can include enhancing or adding additional infrastructure or the rehabilitation or construction of buildings and facilities. The increased value of the property resulting from these improvements becomes the *incremental assessed value*, or the total value of the property, minus the base assessed value (Klacik and Nunn, 2001, 20). The additional tax revenue generated from the incremental assessed value becomes the *incremental revenue*, which is used to pay back any financing or costs associated with those improvements. The additional revenue, or incremental revenue, continues to accrue to the development authority until such time that those improvements have been paid for, or when the enabling legislation expires (Stinson, 1992, 143). The creation of a TIF district does not increase the amount of property taxes owners have to pay. Instead, it is a means of earmarking or directing the increase in revenue generated from the improvements for the specific purpose of paying for them (Chikow, 1998).

As illustrated in Figure 9.1, tax increment financing has been used to fund myriad public projects (Illinois Tax Increment Association, 2006; New York City Independent Budget Office, 2002; West Virginia Development Office, 2003). In using this economic development tool, localities have pursued the building of schools and libraries, parks and recreational facilities, and the remediation of environmentally damaged lands. Moreover, TIF has been leveraged to facilitate sustainability retrofits of public buildings and private homes.

TIF is not without its detractors. Some point to the issue that overlapping jurisdictions, such as school districts, lose revenue they normally would be entitled to (Edwards, 2007, 352). Because the incremental revenue—or the additional

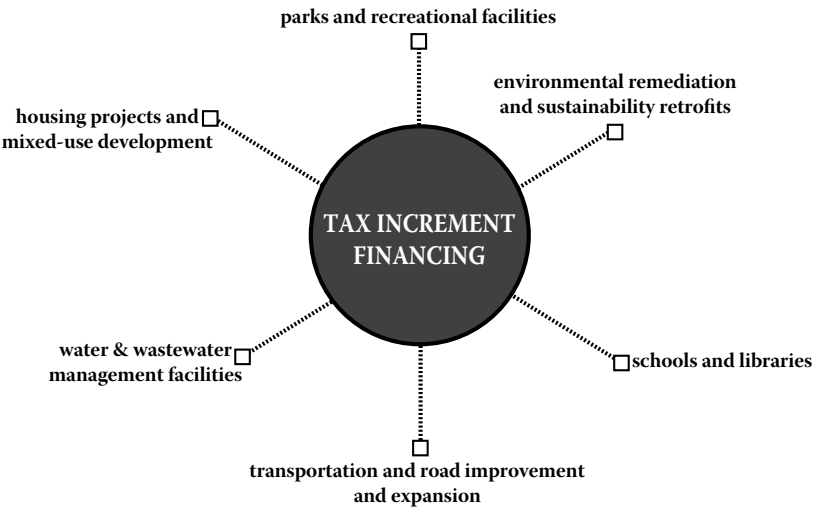

Figure 9.1 TIF-funded projects.

property taxes generated from the increased property values—is captured and used specifically for the purposes of the district, overlapping tax jurisdictions do not realize those additional gains until the district expires. Thus, in many states, a number of legislative bodies must sign off on a TIF district's creation before it can be implemented. More on this point will be discussed when examining state regulations guiding TIF development.

Ultimately, TIF is attractive to localities because it allows them to recover the costs of development. When redevelopment leads to higher tax revenues in the TIF district, this extra revenue is used to pay back the debt taken on for the development project, instead of added to the general pool of property tax revenue used by local school districts and other jurisdictions (Man, 2001b, 94). These financing arrangements have become a mechanism by which municipalities continue to develop their built environment in the face of declining revenues.

Key Questions to Consider When Exploring TIF

A local government should consider a number of questions when exploring TIF as a policy tool (Council of Development Finance Agencies and International Council of Shopping Centers (CDFA and ICSC), 2007, 2). As is the case with public–private partnerships, the first set of questions a locality should consider is whether this particular tool is in the public's best interest and whether the intended outcomes of the project resulting from the financing are in line with the community's vision for development, both in an economic and in a built-environment sense (Davis, 1989).

Similarly, will the TIF result in a net improvement of the locality's economic situation, or will it result in a shuffling of where that development will occur (Brick, 2002)? Perhaps most important, will the incremental revenue be sufficient to cover the costs associated with whatever improvements are being considered (New York City Independent Budget Office, 2002)?

The second set of questions deals with the statutory or regulatory environment of both the locality and the state (Klacik and Nunn, 2001). First, the legislation at both levels must be examined to determine which types of properties are eligible for inclusion in a TIF district. It may be the case that only blighted, underdeveloped, or underutilized areas can be included in a TIF district. Alternatively, the regulations or statutes may provide for a broad range of properties to be included in a TIF district.

In most states, "but for" requirements must be met before a TIF can be established. These require jurisdictions to estimate the probability that the properties in the area will be developed without the use of TIF (Kriz, 2003, 2). In other words, "but for" requirements direct localities to certify or determine that development would not have occurred there but for the assistance of the financing district. The legislation also may provide clear guidance or require that the incremental revenue be spent on specific activities and improvements.

Factors commonly considered when trying to ascertain whether development would have occurred without TIF include length of time area has been underdeveloped, direction of development toward planned areas, previous failed attempts, and private sector financing issues (CDFA and ICSC, 2007, 8). If an area has gone undeveloped or even underdeveloped for an extended period, a case can be made that a specific economic development tool, such as TIF, is necessary and that, without it, it is unlikely that development will occur (Healey and McCormick, 1999).

Localities also may seek to use TIF to direct development toward specific areas for reasons, such as curbing sprawl or tapping into existing infrastructure. For example, while it may be attractive for a developer to build a new facility on previously unimproved land, doing so can contribute to unnecessary consumption of open space and cause the municipality to incur the costs of extending public utilities to the area that is not served.

Communities, neighborhoods, and even properties tend to have distinct histories that relate to previous attempts at development. These previous attempts are important to developers because they help them calculate the likelihood of a potential project's success (Mayrl, 2006). If an area is failure prone, then it is probable that the developer will seek other alternatives. However, if the developer conducts an analysis and finds a high degree of probability that a project would be successful there, then localities should not seek to enact a TIF. Recall that to meet the "but for" test, the case must be that private developers are unlikely to finance or pursue the project without public assistance. The "but for" test seeks to determine whether public assistance is necessary. If not, then the proposed TIF district will not pass the test.

The Importance of Analysis

Like most policy objectives, TIF should be pursued only after thorough evaluation and analysis of the projected outcomes (Donahgy, Elson, and Knaap, 1999). While it may be the case that proponents of a TIF district provide both anecdotal and empirical evidence that these financing instruments have been successful elsewhere, no two localities and projects are alike. Thus, localities should engage in a planning process around the implementation of TIF that analyzes all potential costs and benefits. In some instances, localities may lack the capacity to undertake such a thorough analysis. In these situations, a number of private, nonprofit, and state agencies can help. Depending on state and municipal law, the cost of these analyses may be able to be recouped through the incremental revenue.

The extent to which a TIF can be labeled a success goes beyond whether or not it will generate sufficient revenue to cover related costs. It is defined as well by the extent to which the planned improvements resonate with the locality's vision for both the area and itself (Krohe, 2007; Luce, 2003). Development for development's sake rarely produces outcomes that contribute to cohesion, in terms of both local economic context and long-term plans for the built environment.

Private Sector Considerations

While some of the improvements resulting from TIF—such as infrastructure—may be within the purview of the locality, routinely it is the case that much of the development will be built by private developers. In light of this, it is important for localities to determine if there are developers willing and interested in the area that will make up the district, or whether a process for identifying potential partners is necessary (Council of Development Finance Agencies, 2008). Localities should be cautious of the "build it and they will come" approach to economic development. Without specific guarantees or even proposals from interested developers, all of the time and effort put into establishing a TIF district may go to waste if there is not private sector interest in developing the area.

TIF is a financing instrument that has implications for how localities engage private developers. For instance, it is crucial to determine whether interested developers will need access to funding at the beginning of a project or if they have sufficient resources to cover any up-front costs and be reimbursed during the development process (CDFA and ICSC, 2007, 3). At the same time, localities will need to determine early on whether the project will require bonds because many times there are significant legal and statutory requirements for issuing them, and the process can be lengthy. Beyond the planning issues, localities increasingly may have such poor credit ratings that it may not be possible to tap into bond markets without the costs outweighing any gains realized from the project. Thus, identifying the specific needs of the project in terms of financings will be a key consideration in evaluating the costs and benefits of using TIF.

Political Considerations

Within the context of property identification, localities should attempt to gain a full understanding of what legal instruments will be necessary to complete the project. For instance, will the municipality need to acquire lands via eminent domain? If so, how will that impact the property owners or residents of the land acquired (Herbold and McEowen, 2009)? If the locality is going to use its authority to take private property for the purposes of economic development, will it retain any control or authority over the land's use (CDFA and ICSC, 2007, 3)? (See Chapter 8 for more information on eminent domain.) The political ramifications of using the power of eminent domain to assemble parcels of land for TIF will generate significant public interest and may ultimately contribute to a project's success or failure. Accordingly, TIF is likely to generate the least controversy when the project is intended to do the following (CDFA and ICSC, 2007, 9):

- Address areas with significant blight
- Provide financing for goals and objectives that are in keeping with a community plan or policy
- Remediate environmentally damaged properties
- Fund infrastructure improvements

Tax Increment Financing Laws

Tax increment financing ventures generate many legal and economic questions related to state constitutional tax and debt restrictions and the statutory requirements for approval of a TIF (Bassett, 2009; Briffault, 2010, 74). This section includes a broad overview of key features of the state regulatory structure governing the use of TIF. Recall that 49 states and the District of Columbia have legislation permitting municipalities to pursue TIF under myriad conditions and requirements.

State Restrictions

Three aspects of state control on municipal finance impact the use of TIF at the local level: public purpose, tax restrictions, and debt limits (Briffault, 2010, 74; Johnson, 2001, 79). An overwhelming number of states constrain TIF to projects that serve a public purpose. Traditionally, this has been a clear and specific requirement to meet. However, a growing body of jurisprudence, especially with the recent Supreme Court Decision in *Kelo v. City of New London*, holds that taking land and transferring it from one private owner to another qualifies as public use because of the economic benefits likely to be enjoyed by the community from the transfer and redevelopment of property (Herbold and McEowen, 2009). Under this expanded, or clarified, judicial interpretation of public use, private projects that

result in economic development may easily pass the public use requirements set out in some states' legislation.

A number of state constitutions require that tax rates and assessments be uniform throughout an entire taxing jurisdiction, leaving TIF open to judicial challenge, given the difference in method of assessment. It is important to recall that TIF does not result in higher tax rates, instead, it diverts the incremental revenue gained from the increased property values due to the redevelopment efforts to pay for the associated costs (Sullivan, Johnson, and Soden, 2002). Challenges to the conformance of TIF on this basis have failed; the courts have found lack of uniformity in the way the revenues are spent and not in the rates or assessments themselves (Briffault, 2010, 75). When arranging TIF, it is critical to develop the project according to applicable laws, especially those dealing with uniformity of rates and assessment.

The issue of debt limits is a more complicated legal matter as it relates to whether or not a TIF district is considered to have a material impact on municipality's level of debt (Geheb, 2012, 185). For most localities, the issue is rooted in the near-universal state constitutional limits on municipal debt or requirements that mandate voter approval for the issuance of municipal bonds (Briffault, 2010, 76). However, municipal debt limits are generally restricted to that which is backed by the full faith and credit of the local government. In most cases, TIF bonds do not commit city resources to their repayment if the incremental revenue is not sufficient to repay the bondholders.

State courts, however, have been split on whether TIF taps into the full faith and credit of a locality and are consequently subject to municipal debt limits. Similarly, state courts have generally been divided on whether TIF debt requires public approval. As a result, localities must have a solid understanding of the jurisprudence and precedence on the issue of TIF before moving forward.

Statutory Conditions

Beyond the issue of state constitutions and their requirements for municipal debt and finance, several statutory conditions enacted by legislatures govern the use of TIF: "but for" causation, public hearings, cost-benefit analyses, and blight (Briffault, 2010, 76; Byrne, 2012). While these requirements are common, they are not universal among all states. Thus, these are discussed in the hope that public administrators and nonprofit administrators will make themselves familiar with the relevant legislation and statutes, or hire someone to do so, before forming a TIF, so they can ensure the resulting work can withstand judicial scrutiny.

"But For" Requirements

The primary impetus and underlying assumption for any TIF effort is that the resulting development would not have happened "but for" the creation of the TIF district (Carroll, 2008). Some states have strict statutes governing the exact manner

in which the "but for" causation can be established. However, less than half of the states continue to have the "but for" requirement in their statutes, and in those where it remains, the test is not applied very strictly (Briffault, 2010, 76).

Whether or not state legislation requires a "but for" test, it should be noted that if private financing is available and developers would invest in the area without the assistance of TIF, then municipalities should avoid using this financing arrangement, as it does redirect public resources for a particular purpose that may not be necessary. If property values can be increased via development or redevelopment without a TIF district, the incremental revenues generated would instead be able to be distributed across the locality to areas and needs that meet the wider public interest.

Public Hearings and Cost–Benefit Analysis

Forty-eight of 50 states require in their enabling legislation that public hearings be held when considering the adoption of TIF. Similarly, 22 states require some type of cost-benefit or feasibility study prior to adoption (Byrne, 2010, 15). Both of these requirements indicate an underlying assumption that information and transparency are necessary parts of the decision-making process when considering TIF. In fact, it has been demonstrated that public input has been the hallmark of the more successful TIF projects. Without it, public administrators or nonprofit managers cannot ensure the project will meet the public interest without first seeking to identify it in a shared dialog. Building on the concept of thorough and informed deliberations, the cost-benefit analysis requirements found in some states are designed in part to provide both the public and key decision makers with the necessary information to make informed decisions.

Blight

Findings of blight or underdevelopment remain a legal requirement in 33 states before TIF districts can be created or implemented (Briffault, 2010, 78). While, historically, findings of blight were narrowly defined and very much in keeping with the traditional notions of the term, a number of court cases have recently expanded the definition of blight. In some cases, legislation has been crafted to allow for TIF in areas where blight has not yet occurred, but the TIF is intended as a preventative measure. In other states, findings of blight are not required, thus allowing TIF for general economic development.

States may require either quantified or nonquantified findings. Quantified blight legislation requires a certain percentage of land included in the TIF district to be blighted. For example, a quantified blight requirement could dictate that at least half of the proposed district be underdeveloped, need refurbishment, or have industrial development potential. In addition, the requirements may restrict the percentage of the municipality's total land that can be included in such a

district (Huddleston, 1981, 12). In other states, there may be a general requirement for a finding of blight without specifying an exact percentage (Johnson and Kriz, 2001, 38).

Ultimately, requiring that areas included in a TIF district be blighted may be an essential requirement for success, as previous studies have demonstrated that truly blighted properties are more likely to benefit the most from TIF than are other areas (Byrne, 2006, 318).

Other Requirements

In addition to the broader categories of requirements found in state laws governing the use of TIF, both state and municipal legislation may dictate which expenses related to the district may be covered. For example, the following expenditures are generally covered under a number of state statutes and municipal ordinances (Illinois Tax Increment Association, 2006):

- Utility relocation and burial
- Property acquisition and demolition of existing buildings, structures, and fixtures
- Professional fees for architectural, engineering, legal, and financial planning services
- Costs of environmental impact studies
- Marketing efforts for businesses and residences in the TIF

Table 9.1 shows the wide variance in state regulations and requirements for enacting TIF districts as of 2012 (Council of Development Finance Agencies, 2012). The table provides a state-by-state outline of those requirements at the time, including the following:

- Which governmental units are authorized to enact TIF districts
- Which approval agencies are included in the decision-making process
- Requirements for district creation, including blight and the "but for" test
- Maximum length of time that the district may exist
- Type of district allowed (site/project specific and district/area wide)
- Whether public hearings are required for TIF district authorization or approval

While these requirements are definitely dynamic and not static, and given the legal complexities associated with tax increment financing, public administrators and nonprofit managers should be careful to consider the statutory and legal environment in which they seek to create this type of financing.

Table 9.1 2012 Tax Increment Finance Regulations by State

State	*Terminology*	*District Approval Agencies*	*Project Approval Agencies*	*Requirements for District Creation*	*Maximum Length of District*	*Site/Project Specific TIF Allowed*	*District/ Area Wide TIF Allowed*	*Public Hearings Required for TIF District Authorization*	*Public Hearings Required for TIF Deal Approval*
Alabama	TIF	City, County	City Council, County	Blight; public hearings	30 years	Yes	Yes	Yes	Yes
Alaska	TIF	Municipality	Municipality	Blight	None	Yes	Yes	No	No
Arkansas	TIF	City, County, Township	City Council, Town Council, Quorum Court of the County	Blight; feasibility study; public hearings	25 years	Yes	Yes	Yes	Yes
California	TIF	City, County	Community Redevelopment Agency Board	Blight	50 years	Yes	No	Yes	Yes
Colorado	TIF	City	City; State	Blight; public hearings; impact report to county	25 to 50 years depending on statute	Yes	Yes	Yes	No
Connecticut	TIF	City, Town	City Council, State	Feasibility study; creation of local development agency	Bonds must be repaid in 40 years; no expiration of districts	Yes	–	Yes	No

Delaware	TIF	City, County	School Board/ District, City Council, County, Delegated by bond issuer	Blight; but for test; feasibility study; public hearings; consistency with comprehensive plan	30 years	Yes	Yes	Yes	No
District of Columbia	TIF	City	City Council	But for test; cost-benefit analysis; feasibility study; various recommended criteria	In TIF agreement	Yes	Yes	No	No
Florida	TIF	City, County	City Council; Community Redevelopment Agency Board; County	Blight; property condition analysis; feasibility study; public hearings	20 years, up to 40 with extensions	Yes	Yes	Yes	Yes
Georgia	Tax Allocation District (TAD)	City, County	City Council, Community Redevelopment Agency Board	Public hearings; area has not been subject to growth/ development	Not specified; until redevelopment costs are paid	Yes	Yes	Yes	No
Hawaii	TIF	County	County, Redevelopment Agency-if agreement in place	Consistent with redevelopment or other existing plans	Determined by ordinance	Yes	Yes	Yes	Yes

(continued)

Table 9.1 2012 Tax Increment Finance Regulations by State (continued)

State	*Terminology*	*District Approval Agencies*	*Project Approval Agencies*	*Requirements for District Creation*	*Maximum Length of District*	*Site/Project Specific TIF Allowed*	*District/ Area Wide TIF Allowed*	*Public Hearings Required for TIF District Authorization*	*Public Hearings Required for TIF Deal Approval*
Idaho	Revenue Allocation Area	City, County	Community Redevelopment Agency Board	Blight; need for economic development; property condition analysis; feasibility study; public hearings	24 years	Yes	Yes	Yes	No
Illinois	TIF	City	Joint Review Board, City Council	Blight; but for test; public hearings; conservation	23 years; 35 with extensions	Yes	Yes	Yes	No
Indiana	TIF	City, County, Townships	TIF Commission, City Council	Blight; threat of blight; need for economic development; property condition analysis; feasibility study; public hearings	Unstated, but 25 years after financing is in place	Yes	Yes	Yes	No
Iowa	TIF	City, County	City Council, County	Blight; public hearings; slum finding or economic development finding	20 years	Yes	Yes	Yes	Yes

Kansas	TIF, Sales Tax and Revenue Districts (STARS)	City	School Board/ District, City Council, County (if affected), State if STAR Bonds sought	Cost-benefit analysis; feasibility study; public hearings	20 years	Yes	No	Yes	No
Kentucky	Local Development Area or Development Area	City, County	City Council, County, Other local taxing districts, except for schools and fire districts may agree to pledge revenues	Blight for development areas only; need for economic development; public purpose (very broad); property condition analysis; but for test; cost-benefit analysis; public hearings	40 years, with local pledges of revenue limited to 30 years and state revenues to 20 or 30 years	Yes	Yes	Yes	No
Louisiana	TIF	City, Parish	TIF Commission	Public hearings	30 years	Yes	Yes	Yes	No
Maine	Municipal Tax Increment	City, County	City Council, State	Blight; need for economic development; conservation work; arts district; cost-benefit analysis; public hearings	30 years	Yes	Yes	Yes	Yes

(continued)

Table 9.1 2012 Tax Increment Finance Regulations by State (continued)

State	*Terminology*	*District Approval Agencies*	*Project Approval Agencies*	*Requirements for District Creation*	*Maximum Length of District*	*Site/Project Specific TIF Allowed*	*District/ Area Wide TIF Allowed*	*Public Hearings Required for TIF District Authorization*	*Public Hearings Required for TIF Deal Approval*
Maryland	TIF	County, Municipal corporation	Signing local government official, Issuer's counsel	Need for economic development; public hearings (indirectly); local guidelines and policies	Not specified	Yes	Yes	Yes	No
Massachusetts	District Improvement Financing (DIF)	City, Township	City Council, State, Town Board of Selectmen	Feasibility study; public hearings	30 years	Yes	Yes	Yes	No
Michigan	TIF	City, County, Township, Redevelop-ment Authority	TIF Commission, City Council, Community Redevelopment Agency Board, State	Public hearings	30 years	Yes	Yes	Yes	Yes
Minnesota	TIF	City, County, Township, Redevelopment Authority, EDA's, Port Authorities	City Council, County, Governing Body of Authority	Blight; need for economic development; but for test; property condition analysis; public hearings	26 years	Yes	No	Yes	No
Mississippi	TIF	City, County	City Council, County	Cost-benefit analysis; public hearings	30 years	Yes	Yes	Yes	Yes

Missouri	TIF	City, County	City Council	Blight; but for test; cost-benefit analysis; public hearings	23 years	Yes	Yes	Yes	Yes
Montana	TIF	City, County	City Council, County, Urban Renewal Authority	Blight; cost-benefit analysis; feasibility study; public hearings; infrastructure deficiency in industrial cases	15 years with maximum extension of another 25 years for bond	Yes	Yes	Yes	No
Nebraska	TIF	City, Redevelopment Authority	School Board/ District, City Council	Blight; but for test; cost-benefit analysis; feasibility study; public hearings	15 years	Yes	No	Yes	Yes
Nevada	TIF	City, County, Redevelopment Authority	–	Blight	45 years for Redevelop-ment Areas; 30 years for TIF	Yes	Yes	Yes	No
New Hampshire	Development District	City, Township	City Council, Board of Selectmen (town)	Public hearings	Life of bonds	Yes	No	Yes	No

(continued)

Table 9.1 2012 Tax Increment Finance Regulations by State (continued)

State	*Terminology*	*District Approval Agencies*	*Project Approval Agencies*	*Requirements for District Creation*	*Maximum Length of District*	*Site/Project Specific TIF Allowed*	*District/ Area Wide TIF Allowed*	*Public Hearings Required for TIF District Authorization*	*Public Hearings Required for TIF Deal Approval*
New Jersey	Economic Redevelop-ment and Growth Grant Program	City, Township, Borough	City Council, State, State local finance board	Blight; planning area, designated by State Planning Commission; but for test; cost-benefit analysis; feasibility study; public hearings	Not specified	Yes	Yes	Yes	Yes
New Mexico	Tax Increment Development District	City, County	City Council, County, State	Need for economic development; cost-benefit analysis; feasibility study; public hearings	Not specified	Yes	Yes	Yes	No
New York	TIF	City, County, Township, Borough, Redevelopment Authority, Industrial Development Agencies, Other public benefit corporations	City Council, Community Redevelopment Agency Board, County, All involved local taxing jurisdictions	Blight; cost-benefit analysis; but for test; feasibility study; public hearings; inability of project to proceed with private resources alone	No limit except the "useful life" of the TIF-funded improvement	Yes	Yes	Yes	No

North Carolina	Project Development Financing	City, County	Issuer and subject to review by Local government commission. Industrial projects are subject to wage restrictions and to environmental review	Blight; threat of blight; need for economic development; but for test; public hearings	30 years	Yes	Yes	Yes	No
North Dakota	TIF	City	City Council	Blight; public hearings	15 years, but no limit with extensions	Yes	Yes	Yes	Yes
Ohio	TIF	City, County, Township, School Board when above certain levels	City, County, Township, School Board has periodic reviews	Depends, but possibilities include: blight; inadequate public infrastructure; public purpose finding	10 years, or 30 years with school district approval	Yes	Yes	No	No
Oklahoma	TIF	City, County	City Council, County, Review Committee	Reinvestment area, historic preservation area, and/or enterprise area; unproductive, underdeveloped, or blighted areas; but for test; public hearings; project plan	25 years	Yes	Yes	Yes	Yes

(continued)

Table 9.1 2012 Tax Increment Finance Regulations by State (continued)

State	*Terminology*	*District Approval Agencies*	*Project Approval Agencies*	*Requirements for District Creation*	*Maximum Length of District*	*Site/Project Specific TIF Allowed*	*District/ Area Wide TIF Allowed*	*Public Hearings Required for TIF District Authorization*	*Public Hearings Required for TIF Deal Approval*
Oregon	TIF	City, County, Redevelop-ment Authority	TIF Commission, City Council, County (if outside city limits)	Blight; property condition analysis; feasibility study; public hearings; financial impact to overlapping tax districts	Not specified	Yes	Yes	Yes	Yes
Pennsylvania	TIF	City, County, Township, Borough	Community Redevelopment Agency Board	Blight; property condition analysis; public hearings	20 years	Yes	Yes	Yes	No
Rhode Island	TIF	City	Community Redevelopment Agency Board	Blight; but for test	25 years	Yes	Yes	Yes	No
South Carolina	TIF	City, County	School Board/ District, City Council, County, each affected taxing entity	Blight (except for counties); public hearings	Not specified	Yes	Yes	Yes	No
South Dakota	TIF	City, County	Planning Commission	Blight requirement; feasibility study	15 years	Yes	Yes	Yes	No

Tennessee	TIF	City, County Redevelopment Authority	TIF Commission, City Council, County	Blight requirement; mixed-use	Limited in the redevelopment plan	Yes	Yes	Yes	No
Texas	Tax Increment Reinvestment Zone (TIRZ)	City, County	City or County, depending on the district	Blight; property condition analysis; public hearings	None. Terminates when project costs are paid in full	Yes	Yes	Yes	No
Utah	TIF	City, County	School Board/ District, City Council, Community Redevelopment Agency Board, County, State	Blight; cost-benefit analysis; feasibility study; public hearings; taxing entities approval	Depends on agreement	Yes	Yes	Yes	Yes
Vermont	TIF	City, Town, or Incorporated Village	City Council, State, Municipal Legislative Body	But for test; public hearings; location criteria; public good outcome; nexus/ prop	20 year limitation on use of tax revenue to pay any debt	Yes	Yes	Yes	Yes
Virginia	TIF	City, County, Township	Governing body of locality	Blight helpful, but development needs generally	No specific timeframe	Yes	Yes	No	Yes
Washington	Increment Area; Revenue Development Area	City, County	City Council, County, Fire protection district	But for test; public hearings	None	Yes	Yes	Yes	No

(continued)

Table 9.1 2012 Tax Increment Finance Regulations by State (continued)

State	*Terminology*	*District Approval Agencies*	*Project Approval Agencies*	*Requirements for District Creation*	*Maximum Length of District*	*Site/Project Specific TIF Allowed*	*District/ Area Wide TIF Allowed*	*Public Hearings Required for TIF District Authorization*	*Public Hearings Required for TIF Deal Approval*
West Virginia	TIF	City, County	City Council, County, State	Blight; need for economic development; public hearings; certified-based assessed value of properties in the district; state approval; approval of municipalities (as applicable); notice to local levying bodies	30 years from date of creation of district	Yes	Yes	Yes	No
Wisconsin	TIF	City	Joint Review Board, City Council, Community Redevelopment Agency Board	But for test; cost-benefit analysis; public hearings	27 years, 40 with extensions	Yes	Yes	Yes	Yes
Wyoming	TIF	City, Township	Planning Commission	Blight; but for test; public hearings	25 years	Yes	Yes	Yes	No

Source: The Council of Development Finance Agencies, 2012. With permission. (Note: The information is accurate as reported to CDFA as of 2012.)

Project-Specific versus District-Wide TIF

Tax increment financing can be arranged to be either project specific or district wide. Much like the issues discussed in the chapter on public–private partnerships, it is important that the right model or form be chosen for the TIF to be successful. Project-specific TIF is a financing arrangement designed to support a narrowly defined activity or set of activities. It also tends to include a more limited amount of property (Man, 2001b, 92). District-wide TIF, in contrast, is more expansive in terms of both area and scope. The district-wide approach is generally pursued when trying to revitalize, rehabilitate, or redevelop large swaths of land. Each type of TIF has advantages and disadvantages.

Project-Specific TIF

Project-specific TIF has the advantage of involving fewer participants, so it can generally be established more quickly than the alternative. Because this form of TIF often is focused on property with interested owners, and because it does not require local governments to assemble and seek participation from a number of owners, these TIF projects rarely include the use of eminent domain or face legal challenges (Berwyn Development Corporation, 2012; CDFA and ICSC, 2007, 13).

Another advantage is the limited diversion of tax revenues that would otherwise go into the coffers of local governments. Because TIF sets aside the incremental revenue received due to related activities and improvement, that money becomes sequestered for a specific purpose and is not realized or gained by the locality until the TIF expires.

The same advantages of pursuing project-specific TIF also contribute to its disadvantages. Comparatively, project-specific TIF carries more risk because success depends on a single developer or piece of property to generate improvements in the area. This also may complicate the financing situation because investors may be less likely to purchase bonds that are tied to the incremental revenues generated from a single project. The alternative is less sensitive to the impact of individual property owners or the success of one part of the project.

Another factor is that project-specific TIF may be too narrow in scope, failing to account for underlying causes of blight or leading to changes that do not benefit the entire community (CDFA and ICSC, 2007, 13). Thus, project-specific TIF proposals need to be evaluated to ensure that they do not unnecessarily benefit one party over the other and that the effects will extend beyond the property owner and the affected parcel of land.

District-Wide TIF

District-wide TIF is much more comprehensive and expansive than project-specific TIF. It is traditionally structured to cover large amounts of land and may even

encompass an entire neighborhood. Whereas district-wide TIF is routinely used to address blighted areas or areas targeted for redevelopment, it also may include areas or properties not targeted for redevelopment. This type of TIF is commonly used when attempting to revitalize and improve the overall economic condition of an entire community.

District-wide TIF is advantageous in that it allows for a comprehensive plan or vision to take place, which may include transit infrastructure, parks, green space, and other amenities designed to attract visitors. When these things are combined with commercial development, TIF districts become beacons for new and existing businesses looking to locate somewhere that is welcoming and attractive to potential customers. Land assembly—the merging of smaller parcels into larger, single swaths of land—can be achieved through district-wide TIF, which may make land more attractive to businesses or developers that need large amounts of square footage.

Although district-wide TIF has comparatively more advantages and is more in keeping with the overall assumptions and theories underlying tax increment financing, there are disadvantages to this approach. Residents and business owners of the area may be nervous about the intent of the project and be concerned about their future place in the redeveloped area. Much like with public–private partnerships, there should be an ongoing conversation with members of the community affected by the proposed TIF, with plenty of opportunity for public participation. (See Chapter 6 for the Public Participation Spectrum.) Failure to secure public support or to address those concerns may generate enough political discomfort to block creation of the TIF.

Similarly, property owners facing the prospect of not being included in the TIF district may feel left out of the potential outcomes associated with receiving the incremental financing to improve their own properties (Bassett, 2009). It is important that localities have clear TIF guidelines and policies to provide both residents and developers with a transparent understanding of the process, which may or may not ease some of their concerns (Council of Development Finance Agencies, 2008; Youngman, 2011).

Common Steps in TIF Creation

The TIF creation process is complex and is governed by state statutes and municipal ordinances (Hoyt, 2012; Keller, 2012; Klacik and Nunn, 2001; Sullivan, Johnson, and Soden, 2002). It is impossible to provide a concrete set of steps that is applicable in every state or locality. However, a set of common requirements can be discussed to provide an overview of the TIF creation process. This section first outlines the broad steps that are representative of a generic TIF planning and implementation process (Klacik and Nunn, 2001, 18) and then shifts to the example of steps that must be taken in the state of Illinois.

General TIF Creation Steps

In the broadest sense, the initial phases of TIF creation are focused on conducting an analysis that looks at three basic aspects: (1) deciding if there is a need, (2) determining if the area meets eligibility requirements, and (3) reviewing related financial information (Klacik and Nunn, 2001, 18). Thus, in any process where TIF may be considered, the first step is heavily focused on the thorough conduct of a feasibility study that looks at both whether the project is feasible in terms of attracting private developers and whether the financial situation makes sense. Recall that many regulations governing the use of TIF require a finding that private development would not have happened without public assistance. Thus, it is important that any feasibility study include an analysis of the likelihood of whether development would have occurred without the TIF.

Subsequently, the area selected for inclusion in the district will need to be analyzed to ensure that it meets state statutes and municipal ordinances related to blight (if that is required) or some other determination that the project is related to economic development. In some jurisdictions this will be an easy threshold to meet, and in others it will not. A thorough feasibility study will help in preparing documentation for a finding of blight, if the TIF is located in a state that requires such a determination, and it will be especially beneficial in jurisdictions requiring a quantified finding of blight.

After the district has been defined, the goals of the project have been deemed feasible and financially viable, and all relevant regulatory thresholds have been met, an agreement is drafted. It may include performance measures for private developers and will always include the length of time the TIF district will remain in place. Furthermore, depending on state or local law, it may be the case that the incremental revenue must be spent on specific items or in specific ways. Those issues must be clearly indicated in the agreement.

Once a draft agreement is in place, it is important, and possibly required by law, to hold public hearings on the matter. Before the agreement can be enacted, the consent of overlapping taxing jurisdictions will likely need to be sought, although this varies by state statute (Klacik and Nunn, 2001, 19). The hearing requirements are beneficial for the public both in terms of transparency and in terms of creating a mechanism where the overlapping taxing jurisdictions share in a planning process regarding taxes and development. This type of planning is often missing in the fragmented nature of local government (Kuehn, 1985).

After input has been solicited from both the public and affected taxing jurisdictions, a revised ordinance is created. Then the debt instruments are prepared and issued, base assessed values are established, and the TIF comes to fruition upon issuance of the debt (West Virginia Development Office, 2003). Examples of debt instruments include bonds, interfund loans, and pay-as-you-go-financing (Carroll, 2008; House Research Department, 2010; Weber and Goddeeris, 2007). Bonds are certificates of debt that are sold by a municipality or redevelopment authority.

They are designed to be bought back at some time in the future for the total value plus any agreed-to interest. Interfund loans are monies made available to the project from the public treasury, with the expectation that they will be repaid through incremental revenue. Alternatively, the developers may use their own funds for the project and be reimbursed from the incremental revenues in a pay-as-you-go financing arrangement.

TIF Creation in Illinois

Although TIF creation varies from state to state, it is useful to examine one state in greater detail. In the state of Illinois there are 10 essential steps to creating a TIF district (Keller, 2012). The first step is an eligibility analysis, because Illinois state law requires a number of findings before a district can be enacted. These findings must include application of the "but for" test to the proposed area, determination of whether the area is blighted or is in a conservation or industrial park area, and identification of which costs will be financed by the incremental revenues.

The second step, which is not required by law but is advantageous for the locality, is a market analysis that seeks to identify a potential developer who will lead or manage the development or redevelopment of the district. The third step requires that if the project will displace 10 or more residents or remove 75 or more housing units, the municipality creates a housing plan to address the needs of the displaced residents (Keller, 2012). Fourth, the boundaries of the district must be defined and be no less than 1.5 acres in size and contiguous in nature. Fifth, after the borders of the district have been determined, a development plan must be formed. According to Keller (2012, 4), the plan must include analysis and discussion of six items: projected costs for the project, financial analysis of the impact the project will have on other taxing districts, funding sources, financial instruments (including bonds) and their terms, recent equalized assessed value of the district, and an estimate of the equalized assessed value after the completion of the project."

The sixth step is that once the redevelopment plan is finalized, the municipality must create an interested parties registry that allows anyone to be added to the list of individuals who will receive information on the TIF creation process (Keller, 2012, 4). Seventh, public hearings must be held at specific locations and on a specific schedule. Notices must be sent to all property owners in the proposed district and individuals on the registry as well as being published in a local newspaper. Eighth, a Joint Review Board consisting of a representative of every taxing body impacted by the district must be scheduled to meet with each jurisdiction receiving notice of the meeting, in addition to the state Department of Commerce and Economic Development. After the appropriate notices have been posted within the appropriate time frame, both a public hearing and a meeting of the Joint Review Board are held.

Ninth, once these steps have been completed, the TIF is created by the adoption of three separate ordinances (Keller, 2012, 5) that do the following:

- Approve and adopt the redevelopment plan
- Set the boundaries of the district
- Authorize the tax increment financing for the district

After each of those ordinances has been passed, they are filed with the county clerk, who sets the base assessed value at that time. And, last, any financing instruments adopted by ordinance are issued or implemented.

Although there are common steps associated with all TIF creation efforts, the state of Illinois provides a clear example of the complexities and variability found among the approaches of states in dealing with the creation of TIF districts. Thus, public administrators and nonprofit managers should assess their organizations' capacity to undertake these activities and determine whether it is necessary to get outside assistance. In either event, it is essential that localities have a clear understanding of the regulatory environment governing TIF creation and use. Operating outside those requirements can leave the locality open to legal challenges by developers and residents alike. Municipalities in other states will find it absolutely necessary to understand the framework of their individual state.

Tax Increment Financing and Sustainable Development

Tax increment financing has been used to fund many municipal projects, including those that promote environmental sustainability and the redevelopment of environmentally contaminated properties. According to the National Conference on State Legislatures, more than half of local government funds used to redevelop brownfield sites come from tax increment financing (Runyon, 2003, 7). This section provides two examples of localities using TIF to further sustainable development.

Atlantic Station, Atlanta, Georgia

The Atlantic Station project in Atlanta, Georgia, is one well-known example of a TIF agreement furthering sustainable development (Weber and Goddeeris, 2007). The site was the former home of the Atlantic Steel Industries facility and a chemical company specializing in fertilizer. Because of environmental contamination, it was unlikely that development would have occurred without the assistance of the city. Part of the agreement between the city and the developer was that the city would reimburse the developer for environmental remediation and infrastructure costs with the incremental revenue that would be generated from the improvements.

Atlantic Station is now a "live–work–play" community, which includes residences, offices, stores, a movie theater, and restaurants (Atlanta Convention & Visitors Bureau, 2012). The project used smart growth principles and is now home to a LEED (Leadership in Energy and Environmental Design)-certified building. It

has become a shining example of sustainability and economic development. A once environmentally degraded site originally valued at $7 million now has an assessed taxable value of $428 million, which, after the expiration of the TIF district, will generate significant revenues for the city.

Buzz Westfall Plaza, Jennings, Missouri

Another best practices example of TIF being used to pursue sustainability and economic development is the Buzz Westfall Plaza on the Boulevard Project in Jennings, Missouri (suburb of St. Louis). The project area encompassed 67 acres that included an outdated, largely empty shopping mall (CDFA and ICSC, 2007, 51). In hopes of redeveloping the area, local officials identified a developer who would lead the redevelopment efforts if the city enacted a TIF to help cover the increased and extra costs associated with dealing with the project's grayfields and brownfields (discussed in Chapter 2). Now the redeveloped area boasts a 98% occupancy rate, and the project created 600 temporary construction jobs and 1,000 permanent ones (CDFA and ICSC, 2007, 51).

Lessons Learned

In these examples, tax increment financing was leveraged to address issues of both environmental contamination and degradation and increased economic development. These TIF districts helped to attract developers who would otherwise have been uninterested in the property because of the costs associated with retrofitting existing buildings to meet current needs and with cleaning up contaminated areas. In addition to revitalizing the areas, these efforts helped to control sprawl, as the TIF agreements were able to direct growth to areas that were underutilized instead of toward greenfields (areas of undeveloped land). Thus, if used appropriately, TIF can serve many purposes if the planning is done with intention.

Conclusions and Concepts in Action: Fort Worth, Texas

Tax increment financing has become one of the most popular tools to use when pursuing local economic development. It is also a mechanism by which public administrators and nonprofit managers have found common ground between economic development and sustainability. Since the inception of TIF districts in California in 1951, almost every state has put enabling legislation in place to allow cities, counties, and other jurisdictional units to create these districts to fund public improvement projects.

The regulatory framework governing the use of TIF is complex, and, thus, it is essential that localities gauge their own capacity to undertake such a complex and

technical process without the requisite expertise. But, most of all, public administrators and nonprofit managers should ensure that the development resulting from a TIF district is in keeping with the community's comprehensive plan and vision, and that it is designed to meet the public's interest and not those of developers.

The following case study provides practitioners with an in-depth examination of one city's use of TIF to pursue a sustainability initiative. In doing so, the author makes clear that the intersection of economic development and environmental protection are not competing objectives. In fact, the case study provides interested public administrators and nonprofit managers with an example of how an economic development project can include enhanced flood protection, increased recreational facilities and restore balance to an inland waterway ecosystem. In doing so, the City of Fort Worth, Texas, goes beyond ensuring the sustainability of the end product, but sought to ensure the sustainability of even the construction practices utilized in the project. And, perhaps most importantly, emphasizes the point that TIF projects be utilized in pursuit of the public interest and stresses public involvement in all stages of the project.

TRINITY RIVER VISION AND TAX INCREMENT FINANCING

Tax Increment Financing in Texas

In Texas, TIF is governed by Chapter 311 of the Texas tax code. TIF funds may be used only to assist in public project costs and may not be used solely to benefit private development. Project costs are defined in Section 311.002(1) as "the expenditures made or estimated to be made and monetary obligations incurred or estimated to be incurred by the municipality or county designating a reinvestment zone that are listed in the project plan as costs of public works, public improvements, programs, or other projects benefiting the zone, plus other costs incidental to those expenditures and obligations." These project costs include but are not limited to capital costs, financing costs (including interest), real property assembly costs, professional service costs, imputed administrative costs, relocation costs, organizational costs, cost of operating the reinvestment zone and project facilities, and cost of school buildings and other educational facilities.

TIF in Texas may be used to finance project costs within a reinvestment zone; however, municipalities and counties cannot simply designate a reinvestment zone wherever they see fit. The area in question must meet a number of qualifications set forth in Section 311.005(1). First and foremost, the area must "substantially arrest or impair the sound growth of the municipality or county designating the zone, retard the provision of housing accommodations, or constitute an economic or social liability and be a menace to the public health, safety, morals, or welfare in its present condition." In short,

each project must pass the "but for" test, as specified in Section 311.003(a): If the reinvestment zone did not exist and TIF funds were not made available to assist in development efforts, positive development would be unlikely to occur in a timely manner, if at all.

The TIF district's project and financing plan outlines what projects are expected to be undertaken and receive TIF assistance and what those costs are. As specified in Section 311.011(b), every project and financing plan includes a map of the reinvestment zone, duration of the TIF district's term, project descriptions and estimated costs, tax increment projections, and other financial information. This project and financing plan serves as a guidebook for the TIF district's board of directors, a 5- to 15-member body that approves (or disapproves) budgets, projects, and other recommendations provided by the staff of the governing body that created the TIF district.

The board of directors is composed of members appointed by the taxing jurisdictions that levy taxes within the bounds of the reinvestment zone and by the governing body that established the zone (Section 311.009). Only taxing jurisdictions that have agreed to participate financially by dedicating a portion of their increment to the TIF district's fund, through the execution of participation agreements, may be represented by the appointed member on the board of directors. In some cases, taxing jurisdictions may waive their right to do so, as specified in Section 311.009(a).

In most cases, a board member must be at least 18 years old and represent the taxing jurisdiction or governing body that created the zone to serve on the board of directors. However, as specified in Section 311.009(e), if the TIF district was created by a petition, a board member must be at least 18 years old and either be a resident of the county (or adjacent county) in which the TIF district is located or own real property in the TIF district. The governing body that created the TIF district may appoint up to 10 representatives to the board of directors, so long as the total membership does not exceed 15.

TIF History in Fort Worth

TIF has been successfully used in Fort Worth, Texas, since 1995, when the city council established Tax Increment Reinvestment Zone Number Two, commonly known as the Speedway TIF, to support the development of the Texas Motor Speedway (Fort Worth, Texas, Ord. No. 12323, 1995). The boundary was expanded in 1999 to support the "construction, renovation, and operation of educational facilities" within the jurisdiction of Northwest Independent School District (Fort Worth, Texas, Ord. No. 13889, 1999). Since 1995, the city council has approved nine other active TIF districts to promote growth and development throughout Fort Worth, four of which are located in or around

the central business district. Although each of these TIF districts was created for a different reason, all were created with the same objective: To resolve the present and future development challenges of the area.

Some of Fort Worth's TIF districts were created to serve a single purpose, such as to assist with public infrastructure costs associated with a major development like the Texas Motor Speedway, RadioShack's corporate headquarters, or the Cabela's retail store in north Fort Worth. Other TIF districts were designed to promote the development of an area through many smaller-scale projects, such as downtown or the Near Southside.

TIF districts also have been used to assist when the city is unable to do so in tough budget years, when funding for public infrastructure, such as roads and bridges, is limited to only the most necessary of projects. The North Tarrant Parkway TIF in north Fort Worth is a good example of this; the majority of projected TIF funding has been set aside for a road improvement project designed to alleviate traffic congestion and address safety concerns associated with the construction of two new schools in the area. Despite its original purpose, TIF can be used to promote sustainability within a reinvestment zone, such as it has within the Trinity River Vision TIF.

The City of Fort Worth administers 8 of the 10 active TIF districts: Speedway, Riverfront, North Tarrant Parkway, Lancaster, Trinity River Vision, Lone Star, East Berry Renaissance, and Woodhaven. Two TIF districts, Downtown and Near Southside, are overseen by Downtown Fort Worth, Inc., and Fort Worth South, Inc., respectively. As these two nonprofit organizations are intimately involved with the downtown and Near Southside areas, they serve as an excellent resource to achieve the visions for their community.

TIF district management includes preparation of the project and financing plans, financial projections, budget, and TIF funds; project management; and board organization. Additionally, TIF district staff members are prepared to do what is necessary to achieve the goals outlined in the project and financing plan, including working with the business community and the neighborhoods to answer questions and gain buy-in. Partnerships are key to success. Even though the Downtown and Near Southside TIF districts are externally administered, Fort Worth city staff members maintain a strong working relationship with both organizations and support both as necessary.

Trinity River Common Vision

The Dallas–Fort Worth (DFW) region is America's largest metropolitan region that is located on an inland waterway. It is growing, and population rates are expected to reach 10 million by 2030. The area has developed

alongside the Trinity River, part of a 300-mile network between North Central Texas and the Gulf of Mexico (Promise and Tidwell, 2005).

In the late 1900s, it was expected that the Trinity River would become a federally funded navigation canal. However, when federal priorities began to change in the early 1980s, it became clear the objective had changed in order to reclaim land that had been plagued and disregarded due to flooding issues. This change in federal priorities promoted a Common Vision, a partnership among federal, state, and local agencies to address problems and take advantage of opportunities the Trinity River provided (Promise and Tidwell, 2005).

Headed by the North Central Texas Council of Governments (NCTCOG), the main goal of the Common Vision is to stabilize the area and reduce the risk of flood. According to NCTCOG, "If the big flood (Standard Project Flood) were to occur today, detailed mapping of every structure combined with computer modeling shows that more than 22,000 homes and 13-million square meters of business property would be damaged with more than $4 billion in damages and untold loss of life" (Promise and Tidwell, 2005, 10). Because the Trinity River stretches over numerous cities in the North Central Texas region, it is clear that no community can ensure adequate flood protection without a common approach.

The Common Vision does not stop at flood protection; another goal is to clean the Trinity River so the waters will be fishable and swimmable again. Through environmental remediation, these waters and the area around them will be preserved and restored to the gem they once were. Additional recreational opportunities, such as an expanded Trinity Trails System, parks, and ball fields, will be community assets. It also is expected that local and regional economic and transportation engines will help meet the needs of the public throughout the DFW region. Dallas, Fort Worth, and Arlington—the three largest cities along the Trinity River—have each committed to the Common Vision (Promise and Tidwell, 2005).

Fort Worth's Trinity River Vision TIF

On December 16, 2003, the City of Fort Worth created Tax Increment Reinvestment Zone Number Nine, commonly known as the Trinity River Vision TIF, to encourage growth and development of a primarily central area of the city that had been underutilized due to heavy flood risk by the Trinity River (Fort Worth, Texas, Ord. No. 15797, 2003). The original project and financing plan had 11 main goals (City of Fort Worth, 2005), many of which are comparable to the Trinity River Master Plan:

1. Provide enhanced flood protection, including the elimination of "slump areas"
2. Create visual and recreational focal points for the central area
3. Promote higher population density
4. Encourage mixed-use development along the Trinity River
5. Construct an urban lake
6. Provide a constant water level
7. Eliminate levees wherever feasible
8. Provide urban trails consistent with the established Trinity Trail System
9. Improve water quality and expand wildlife habitats
10. Create linkages between different districts and neighborhoods
11. Increase development and redevelopment potential

Updated TIF Plan

In March of 2008, the U.S. Army Corps of Engineers (USACE), Fort Worth District, published a supplement to the final environmental impact statement for the Central City Project. This document was a response to the City of Fort Worth's request to reevaluate the concept of modifying the Trinity River Vision project to include the adjacent Riverside Oxbow Ecosystem project area in order to increase hydraulic valley storage, therefore increasing flood protection of the area (U.S. Army Corps of Engineers, Fort Worth 2008). The USACE concluded that the additional area would be beneficial and also recommended the relocation of Samuels Avenue Dam for "geotechnical and environmental reasons." With this new information, it was suggested that the boundaries of the Trinity River Vision TIF district be expanded to include this area so TIF could be used to supplement the growing costs of the project.

After the addition of the project area, the engineering, architectural, and environmental science consulting firm Freese and Nichols, Inc. provided a more accurate project cost estimate model that also accounted for inflation. The overall cost of the Trinity River Vision project jumped from $435 million in 2005 dollars to approximately $909 million in 2021 dollars, which also increased the amount of required TIF participation from $116 million to just over $320 million. It was not anticipated that the TIF district would generate so much revenue, and the original 20-year term was extended to 40 years to meet the new cost demand (City of Forth Worth, 2009).

The addition of projects, modified boundary area, and extended term warranted an update to the Trinity River Vision TIF project and financing plan. A motion to approve these changes to the plan was approved by the Trinity River Vision TIF board of directors and by the city council in December 2009 (Fort Worth, Texas, Ord. No. 18975, 2009). In addition to the 11 goals

set forth in the original project and financing plan, the update provided 7 others (City of Forth Worth, 2009, 19):

1. Provide enhanced flood protection through additional hydraulic valley storage sites
2. Provide recreational facilities as requested by the community
3. Create a 1,000-acre urban programmed park
4. Provide transportation improvements, including better access to the Trinity River
5. Restore the ecosystem
6. Generate economic development around Gateway Park
7. Connect the east and southeast neighborhoods to the Trinity River Corridor

Project Goals

There are two main project areas in the Trinity River Vision project: Trinity Uptown/Central City and the restoration of Gateway and Riverside public parks. According to the updated project and financing plan, the main goal of the Central City project is to address flood control issues while providing environmental remediation, neighborhood linkages, and recreational elements. The Trinity Uptown project is also realized as the strong community development piece; it is anticipated that most of the mixed-use and office development will happen here. The restoration of Gateway Park will create one of the largest urban programmed parks in the country while prompting development in east and southeast neighborhoods of Fort Worth. Positive community feedback suggested the addition of recreational amenities, including athletic fields, basketball courts, hike and bike trails, a water-splash park, a rowing center, playgrounds, and an outdoor amphitheater.

Based on historical construction activity in the area, it is estimated at least 171 mixed-income new residential units will be built each year until the area is built out (Granger, 2010). The total number of units will increase dramatically if other conditions are met, such as the introduction of additional public transportation options or an upward trend in the housing (and lending) markets.

Focus on Sustainability

To promote density and sustainability, new construction in the Trinity Uptown area must abide by a set of building height standards (including minimum height requirements) and a form-based code. For example, buildings located in neighborhood zones need a minimum height of three floors and may stretch up to 288 feet, depending on the zone specification (Trinity

River Vision Authority, 2011). These height requirements will ensure buildings are constructed as densely as possible, maximizing the area where services are already established. The implementation of form-based code will emphasize the appearance of the streetscape and promote a pedestrian-friendly environment throughout the area, while building more square footage with a smaller footprint (Davis, 2005).

Project partners strive for sustainability throughout the project through conscious construction methods. According to the Trinity River Vision Authority (TRVA), conveyor systems will be used to transport dirt, reducing the need for trucks. Materials used for construction will be used for smaller public infrastructure projects associated with the overall project. Pump stations and flood control gates will be used to manage water flow. Native plants will be utilized in public spaces whenever possible, decreasing the need for additional water (Trinity River Vision Authority, 2012). Additionally, the Development Standards and Guidelines for the Trinity Uptown area will require the use of quality materials during the construction process (TRVA, 2012).

With such an increase in commercial, office, and residential units over the coming years, it is expected the demand for mass transit will increase in order to connect the Trinity Uptown area with the central business district as well as other areas of Fort Worth. According to an update provided by the TRVA to the Trinity River Vision TIF district board of directors, a permanent mass transit system would create an urban village, promote greater density, and provide relief for traditional transportation means (such as roads and highways), thus minimizing the need for parking. An economic analysis conducted by the consulting firm TXP further concluded that investment in a mass transit system would speed up additional venture in the area, thus increasing tax revenue (Granger, 2010, 23).

It is estimated that over $49 million will be dedicated to environmental remediation and ecosystem restoration in the TIF district. For example, according to the updated project and financing plan, developers in the Riverside Oxbow area will preserve 200-year-old trees and redevelop forest in the area. Brownfield redevelopment, the planting of 80,000 new trees, and the conversion of the former Riverside Wastewater Treatment Plant to a wetland area are all part of the overall plan to improve the environmental quality of the Trinity River area.

A number of economic impact studies were conducted to better understand the influence of the Trinity River Vision project. Due to the recession that began in late 2007, it was assumed that no major construction projects would begin over the next few years and the majority of activity that would take place would be associated with predevelopment motions, such as

land acquisition and overall planning. However, it was anticipated that once the development was underway, the Trinity River Vision project area would begin booming with dense, mixed-use development.

Public–Private Partnerships

No city can achieve the Common Vision single-handedly. Not only must cities within the DFW metroplex work together, but a number of strong public–private partnerships were essential to make the vision a reality. Effective and efficient coordination by the NCTCOG, City of Fort Worth, Streams and Valleys, Inc., Tarrant County, Tarrant Regional Water District (TRWD), TRVA, and USACE have been hugely beneficial to the project.

The process that eventually led to the Trinity River Vision Master Plan began in summer 2000 with the collaboration of TRWD, Streams and Valleys, Inc., the City of Fort Worth, USACE, and Gideon Toal Management Services. To formulate an overall plan of action, a series of public meetings were held with local interests and neighborhood groups. Over the span of 3 months, 10 public meetings were held in which two main questions were asked: (1) what does the river mean to you, and (2) what are your dreams for its future? The comments from these meetings led to further development of the plan and outlined specific characteristics and features the community felt were important to consider, including the maintenance of a public asset for all to enjoy; preservation of history and city pride; and the inclusion of additional public amenities, such as public access, further development of an existing trail system, supplemental recreational features and parks, and community investment (U.S. Army Corps of Engineers, Fort Worth, 2008, 17).

The municipality adopted the Trinity River Vision Master Plan and added it to the city's comprehensive plan in October 2003. In addition to administering the Trinity River Vision TIF district, the city coordinated with project partners to draft the updated project and financing plan and ensure it passed through the Trinity River Vision TIF board and city council. City staff members continue to work with other team members to coordinate a successful project.

The updated supplement to the final environmental impact statement provided by USACE helped facilitate the need to update the Trinity River Vision TIF Project and Financing Plan in December 2009. The mission of the USACE is to "[p]rovide vital public engineering services in peace and war to strengthen our Nation's security, energize our economy, and reduce risk from disasters" (U.S. Army Corps of Engineers, 2012). Thus, participation and support of the Trinity River Vision project helps the USACE fulfill its mission.

Streams and Valleys, Inc. is a nonprofit organization that "plans and coordinates recreation enhancements, beautification efforts, and public recognition for the Trinity River and its tributaries in Fort Worth and Tarrant County through volunteer recruiting, fundraising, development, and event programming" (Streams and Valleys, 2011). The group was formed in 1969 by a group of citizens who were concerned with the well-being of the Trinity River after major flooding at the end of the 1940s. Since the group's inception, the redevelopment of the Trinity River has included the planting of thousands of new trees and plants, reestablishment of nearly 50 river trails, and the return of wildlife to the area (Streams and Valleys, 2011).

The TRWD has provided water to the Fort Worth vicinity for over 80 years through its ownership and operation of four major reservoirs: Cedar Creek, Eagle Mountain Lake, Lake Bridgeport, and Richland Chambers. The TRWD also has worked to address flood control issues, such as those identified in the Trinity River Vision project (Tarrant Regional Water District, 2012). In addition to the $64 million the TRWD has already dedicated to the project and the TIF funds that have already been committed, the TRWD entered into a Project Cost Funding Agreement with the Trinity River Vision TIF board of directors to loan up to $226 million to the TIF district in order to prevent project delays (Allen, 2009).

Although NCTCOG has led the charge on a regional level, the TRVA has coordinated the Trinity River Vision project locally. Established in 2006, the TRVA has taken the lead to implement the Trinity River Vision plan and bring all partnering organizations together. TRVA also has been important in engaging the public to gather requests, address concerns, and identify potential issues through public hearings and meetings. In November 2011, TRVA hosted a workshop to promote the involvement of local companies in preparation of upcoming bid opportunities. A follow-up session was held to expose potential contractors to software designed to help with planning. TRVA also hosted a number of events on the Trinity River, including an outdoor concert series, fun runs, and the annual Trash Bash, therefore, increasing public awareness of the project in a fun and exciting way.

Urban development in general, particularly the Trinity River Vision, has become a topic of discussion in SteerFW, Fort Worth Mayor Betsy Price's young leader initiative. This brainchild spurred the Urban Development Task Force, dedicated to "promoting sustainability standards that encompass a balance and focus on environmental, economic, and social consciousness for all local communities" (Labbe, 2012). The Urban Development Task Force will meet with TRVA representatives to get updates on the project and perhaps use some of the successes TRVA has accomplished in its own work to promote sustainable urban development throughout Fort Worth.

Project Progress

As of August 2012, the Phyllis Tilley Memorial Pedestrian Bridge, Cowtown Wakepark, and valley storage work along Northside Drive had all been completed and utility relocations along Henderson Street and valley storage work at Gateway Park were underway. Later this fall, construction will begin on the Main Street Bridge, which will be followed by an early 2013 construction start on the Henderson Street Bridge and the White Settlement Road Bridge later that summer (Tinsley, 2012). Of the four bridges associated with the project, three are set to begin construction within the next five years. It is expected at least two of these bridges—the Henderson Street Bridge and the White Settlement Bridge—will have roundabouts associated with them, allowing traffic to move continuously without stopping. These roundabouts also will provide an opportunity for public art installation, creating a unique experience for those who drive in the area (Rauscher, 2011).

Lessons Learned

Although TIF is used differently and must abide by different laws in each state, the common goals are the same: eliminate blight and spur sustainable growth to create a better future for the community. To make the most of TIF efforts, it is important to have a strong public project and solid public support. Although it is impossible to gain support from all sides of the spectrum, it is achievable to collect important ideas presented by the community in a public forum, much like what was done in the Trinity River Vision project. It is important to keep the community involved and updated through publications, events, and social networking so they feel vested in the project. If not for the community's input, there is a chance the Trinity River Vision project would look much different today than it would if the public had not shared their concerns. Through the participation of neighborhood leaders and stakeholders, the community was able to provide positive feedback that was later implemented in the project and financing plan.

TIF is not for every developer or every project. Public officials should ensure that TIF is the right tool to use by asking some important questions:

- What is the project?
- Where is the financial gap?
- Will enough tax increment revenue be generated to support the project?
- Is the area ripe for development?
- Has a similar project been successfully completed with TIF in another area?

- Do we have support from the other taxing jurisdictions?
- Do we have community support?

These questions will begin to shape conversation between the government agency, the developer, and the public.

Much work remains in Fort Worth. It is estimated that the Trinity River Vision project will be built over the next 25 to 40 years. As a result, "downtown Fort Worth will double in size and the [Trinity] Uptown lakeside district will offer a mix of residential and business opportunities that will substantially expand the city's tax base" (Promise and Tidwell, 2005, 10). According to Jim Noack, the project director for Pier 1 Imports' new corporate headquarters, "No other city in the country can claim this kind of expansion—a singular project that incorporates what is, in the long run, to a great opportunity for the city, the private sector, downtown, urban living, the cultural district, and our Trinity River" (Promise and Tidwell, 2005, 10).

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Chapter 10

Grant Administration and Project Analysis

One of the biggest negative perceptions surrounding sustainable economic development involves the added or excessive costs of being environmentally conscious. While in many cases it may be true that some sustainable methods of development are more expensive than other more traditional types in the short term, it also is true that the federal and state governments have a variety of grant opportunities available to the interested local administrator. Given that the full realization of cost savings common to many sustainable practices requires some level of sophistication in terms of analysis, cities should be aware of the useful analytical techniques available to them to properly analyze the true costs and benefits of proposed developments. Beyond the analytical piece, localities must have a firm understanding of how best to approach intergovernmental grant administration. While neither of these topics can be fully explored in one chapter, a good overview and provision of additional reading resources can get an interested local administrator started.

Intergovernmental Grants to Help Pay for Sustainable Economic Development

Generally speaking, intergovernmental grants come in two forms: block or categorical. Categorical grants are those that have a very specific purpose and cannot be used for anything other than a prescribed purpose. About four fifths of all federal grants to state and local governments are categorical (Henry, 2010). Block grants, on the other hand, tend to be more flexible and can usually be spent on a multitude

of things, so long as they are in the larger policy area that the granting entity desires (e.g., Homeland Security).

In addition to the differences in classifications of grant programs, the method of distribution also varies. Specifically, intergovernmental grants are generally distributed by two methods: formula-based and competitive project-based. Formula-based grants involve funding distributed to lower governments by way of a mathematical formula. For example, the social services block grant is solely a formula-based granting program. The amount of funding received under this program will be mathematically determined by the population of a state (Goldenkoff, 2009). Other mathematical formulas also are used for a variety of other formula-based grant programs. These may include poverty rates, disease rates, educational attainment statistics, and other characteristics of a population that the federal government is trying to remedy.

In addition to the formula-based grants, the federal government often uses project-based distribution methods. Approximately 72% of all federal categorical grants are distributed by competition, or project-based (Henry, 2010). Under a project-based distribution, an entity that desires federal or state funding under a grant program will prepare an application in response to a request for proposals (RFP) or request for applications (RFA) solicitation. These project-based grants are competitive and a review process is pivotal to determining which projects will be funded and how much each project will get. "On paper, at least, 89% of local intergovernmental revenue is provided by state grants. However, an estimated one third of the intergovernmental revenue that local governments receive from their states has actually been furnished by Washington" (Henry, 2013, 216). These grants provided to local governments and funded by federal sources, but awarded by the state governments, are called pass-through grants (Henry, 2013). A city pursuing grant opportunities must look to both federal and state sources.

A community interested in pursuing sustainable economic development should be concerned with what grant opportunities are available to them for this endeavor. A successful grant application can help stimulate an economy, mitigate environmental harms, and provide jobs and revenue for a city. These grants can make the difference between a successful and lucrative project and one that does not ever progress or provide the benefits desired.

Locating and Applying for Federal Government Grants

Increasingly for the past 20 years, the federal government has been digitizing many resources and processes. Thanks to this digital conversion, citizens and other government units are more quickly able to access needed information and resources. As of 2012, a great deal of business can be conducted with the federal and state governments in an online format. Grants available to state and local governments from the federal government are no exception to this rule. The largest and primary resource for local governments searching for grant opportunities is the www.grants.gov Web

site. Created in 2002 as part of the President's Management Agenda (PMA), grants.gov offers users an instantaneous method of locating virtually all of the opportunities available from the federal departments and agencies. Grants available on this Web site equal approximately $500 billion at any given time.

When utilizing grants.gov to search for grant opportunities, it is important that you first ensure that you are searching for opportunities available to your specific type of entity/organization. Not all intergovernmental grants are open invitation, most have restrictions on what type of entity can apply for a specific advertisement. State governments, local governments, city or township governments, special district governments, and Native American Tribal governments are the most common eligible government classifications seen in grant advertisements. Additionally, some grants are restricted to only educational organizations, public housing organizations, nonprofits, or for-profit entities. Using the advanced search option on this Web site will enable a user to filter opportunities by eligible applicant. Filtering also is available for department/agency, funding instrument type, funding activity type, and date posted.

In addition to the broad (and powerful) grants.gov Web site, the federal government also publishes a catalog of federal domestic assistance at https://www.cfda.gov/. Unlike grants.gov this Web site lists all grant and assistance programs, not just those currently available for application. This resource can be useful to a local government attempting to locate a specific type of program for future consideration. Utilizing the contact information available in the listing can help a user determine when and whether an opportunity with this program will be available to them in the near future. In addition to the broad resources available to locate federal grant opportunities, a local government will likely find the Department of Energy (DOE) (http://www1.eere.energy.gov/financing/), the Environmental Protection Agency (EPA) (http://www.epa.gov/ogd/), and the U.S. Economic Development Administration (http://www.eda.gov/ffo.htm) particularly useful for financial opportunities related to sustainable economic development.

In order to fully understand grant program documentation, it is necessary to understand the most common abbreviations and terms used. The following list is a good starting point for understanding the grant lingo:

- **RFP/RFA**: Request for Proposals/Request for Applications (or funding assistance). This is the official posting of a grant opportunity. It will describe eligibility and application requirements for the funding program. A closing date will be listed indicating the deadline for application. Contact information for questions is also found in the RFP/RFA.
- **501(c) (3)**: This refers to the section of the IRS tax code that indicates an organization is tax-exempt. A large portion of RFPs require that the applicant have 501(c) (3) status.
- **LOI**: Letter of Intent/Inquiry. Some grant programs are increasingly asking for early letters of intent or inquiry prior to applying for a funding opportunity.

An LOI is generally a short letter summarizing the intended project/purpose for the grant money. An LOI can be used to "screen" applicants to simplify and expedite review processes (Payne, 2010). It can be used as well to gauge interest in a grant opportunity (Yuen, Terao, and Schmidt 2009).

- **Matching Funds**: This provision refers to the requirement that the project being proposed has a matching dollar amount (usually 50%) of project costs. Usually matching funds must be nonfederal funds (i.e., you cannot use other grants received from the federal government to serve as matching funds). The RFP/RFA will specify how much of the matching funds requirement is cash versus in-kind.
- **In-Kind**: This usually refers to assistance or grants that are not cash-based. A grant program or opportunity can be an *in-kind* opportunity where equipment, advertising, or assistance is provided to the applicant. Alternatively, grant solicitations that require matching can allow for in-kind matches where a local business or nonprofit provides a certain amount in services or goods to the applicant's project.
- **Standard Form 424**: SF-424 is the primary government-wide application form for federal grant assistance. A package of forms related to this can be downloaded from the grants.gov Web site.

Applying for a Federal Grant

Unfortunately, there is some evidence that those who are most successful in obtaining a federal grant are those that need it the least (Collins and Gerber, 2006). In other words, a local or state government that has the resources available to hire a grant writer and/or to dedicate the time of a city employee to pursuing project-based grants may be the one that needs it the least. Even with this harsh reality, there are ways to write and prepare a good grant application with limited resources. Grant applications can be very time consuming to those that pursue them and it is important to be fully prepared and organized before starting the process. Before embarking on a wild search for grant opportunities, it is important to fully identify and define the needs you are seeking to fill. Is the city trying to install energy efficient appliances in city-owned property? Is the city trying to expand their bus routes? Is the city trying to remediate environmental contamination? Without a complete internal analysis of what needs a city is trying to fill, it will be very difficult to adequately justify why a specific grant is needed. Do your goals match the goals of the grant program? If not, it may not be a good use of time or resources to apply. Make sure that you have defined a project that can be reasonably completed. If you are awarded the funding, you will be expected to accomplish what you proposed. Also important to recognize is the fact that most grant reviewers do not want to see a project that will end when the grant money is exhausted. A consideration of longer term feasibility and consistency is needed in most grant programs. Grants technically are not "free" money and do require extraordinary care to ensure proper

expenditure and accountability (Payne, 2010). Rules and regulations are a part of almost all aspects of intergovernmental grants.

Oftentimes an application for grant money will request multiple pieces of documentation and support letters that all take time to obtain and organize. A local government with limited time and resources will likely find the process very frustrating. If it is not possible to have one dedicated person in charge of grant applications on behalf of city, someone willing and able to be an *entrepreneur* will be required. This entrepreneur will certainly need to be prepared to spend some time learning and understanding the rules, requirements, and paperwork needed to successfully apply for grant opportunities. Keeping in mind that only a few project-based grants are awarded in most grant cycles, it is of utmost importance that the city prepares the best application packet possible to maximize their chances of success.

A city that feels that they do not have the necessary grant writing skills to be successful in a grant application can seek outside help. For example, a local or regional college or university may be available to provide assistance. Virtually all academic teaching and research faculty in state-sponsored institutions of higher education have a professional commitment to service to their community. An entrepreneurial person within a city government can seek out connections to academic faculty in order to gain insights and perhaps assistance from experts in the university. Depending upon the type of grant being sought, good academic departments to seek out will likely include: political science, public administration/policy, agriculture, environmental affairs, and economics. Furthermore, if a regional university is a land-grant institution, the *extension* office will be a useful place to seek partnerships. (See http://www.extension.org/ for more information.)

In addition to simply connecting with a faculty member or extension program/office, it may be possible to engage in service learning activities where actual hands-on grant writing assistance is provided by graduate students. Many universities are embracing the concept of service learning in their classrooms. The potential for partnerships between cities and higher education institutions is expected to increase substantially as students demand more job-translatable skills from institutions of higher education. Service learning is a method of teaching and learning that embraces community service and experiential learning. In most service learning courses, students learn by working on real-world projects with community organizations. For example, a nonprofit administration course in an MPA (master's of public administration) program might work directly with a local nonprofit to have students assist clients with tax preparation. Through this experiential learning exercise, students gain hands-on experience through actually working on projects related to their career goals. If a local or regional university or college houses an MPA program, this would be an ideal place for a city administrator to seek out grant writing assistance. Many MPA programs have a City Management and a Nonprofit Administration track that will likely have some level of grant writing training as part of the curriculum. An entrepreneurial city can connect with the MPA director and seek out opportunities to engage in service learning activities

with students learning to write grants successfully. A good resource for learning more about service learning is located at http://www.servicelearning.org/what-service-learning. Additionally, the major accrediting body for MPA programs will provide contact information for the interested administrator: www.naspaa.org.

Once it is determined who will be in charge of the actual writing of the grant application, there are a few tips to be considered when preparing the packet. First and somewhat obviously, follow all directions precisely. Most grant requests for proposals (RFP) or requests for applications (RFA) will have very specific and strict requirements concerning formatting, file type, submission mechanism, and documentation required. Even the best grant application can be denied due to the applicant using the wrong file format or method of submission. Before anything is drafted, be sure to read all of the instructions and understand exactly what limits and requirements the application poses and requires. Additionally, many RFPs will have preformatted documents with text boxes for an applicant to answer questions or fill in information. If a specific question or piece of information does not apply to you then mark it with an N/A, do not leave it blank. If a narrative is required in the application, it is useful to use language directly from the RFP/RFA. For example, if the grant RFP asks for an explanation of the value-added of the project being proposed, make it very clear where that is addressed by using a heading with the title "Value-Added."

Oftentimes the budget section of a grant application can be the most difficult part of a grant application for a local government. It is important that a great deal of care is taken to ensure an appropriate and accurate budget is created. Overestimating or underestimating budgets both can signal that the author of the application is inexperienced. All personnel expected to participate in the project should be listed by title as well as the percentage of time they will be working on the project. Salary requests should be reasonable and similar to equivalent work. Fringe benefits also should be included in the budget. Additionally, in-kind or matching contributions can sometimes strengthen an application (even if not explicitly required). Does the city have a private sector business willing to contribute time or funding to a project? If so, this can signal greater potential for success of the proposal. Matching funding also can signal to a reviewer that a project has greater potential for sustainability upon the conclusion of the funding. Most agencies will have guidance on budget preparation online. For example, the EPA offers guidance at the following Web site: http://www.epa.gov/ogd/recipient/ogd_budget_detail_guidance.pdf.

The following list can assist the grant applicant think about the various parts and steps of a grant application:

- **Brainstorm**: Before you write, brainstorm ideas, needs, and expectations. Bring in other people to assist with this process. Be as creative and open-minded at this point as possible.
- **Overview of Organization**: Many grant RFPs will have a requirement to list an overview of the applicant's organization. This is the applicant's opportunity to "sell" themselves to the grant reviewers.

  - Do you have any recent, important, and brag-worthy news to include?
  - Do you have any interesting facts that will get the reviewer's attention?
  - How long have you been around?
  - What is your mission? How successful are you in your overall mission?
  - Any important statistics that can tell your story?
- **Mission**: If you don't have a mission statement, create one. Does your mission align with the funder's goals and priorities?
- **Project/Proposal Title**: Make this as clear and understandable as possible. If you are only given one line to "describe" your project, what will it say? Will it catch the reviewer's attention? (Johnson, 2010).
- **Benefits**: What benefits does your organization provide to the city, region, community, etc.? What gap do you fill if you are a nonprofit?
- **Budget**: Think about what positions are needed in a project when preparing a budget. Who will be directing the grant? Who will be working in the grant? How much time do you realistically need to accomplish your goals? Utilities costs? Healthcare costs (important to consider is the fact that some changes are expected in who must provide health insurance coverage under the healthcare reform)? Space? Training? (Payne, 2010).

State to Local Government Grants

As mentioned earlier in this chapter, state governments are often very active in intergovernmental grant distribution. Sometimes they are the conduit for federal funds and other times they are the initial granting entity themselves. Either way, state government grant opportunities also are important for a local government interested in sustainable economic development. All 50 states have some bureaucratic entity that deals with local governments. Most of the time these agencies, or sometimes an office in a larger agency, are the best places to start for a search of grant opportunities in a state. The lessons from the federal grant process are the same for the state granting process.

Rules and Regulations for the Newly Awarded City

As most people know—nothing in life is free. While the city that has just received a large federal or state grant for a project may feel like they won the lottery, it is of vital importance that the city understand and comply with the various rules that come along with that funding. A grant award is a legally binding contract that must be treated very seriously and carefully. Upon receiving a grant, it is the responsibility of the recipient to understand what money can be spent on what expense. This is part of the reason that the original budget proposal was so important. In some cases, it is very difficult to change where money is spent during the active duration of the project. If the line item in the budget was for equipment, but you have decided it would be more beneficial to spend it on salary, you will have to consult

the award documentation and your federal or state grant liaison to see whether you can change line items in a budget after it has been awarded.

The grant award letter will usually state the conditions that must be met in the process of spending grant money as well as timelines for progress reports being requested. Documentation is of utmost importance when executing a project that uses grant funds from any source. Audits are not uncommon and having diligently collected documentation will make the audit process much easier for a community. Additionally, a final report is almost always required at the end of the project's duration. This final report will essentially document exactly how the money was spent and what activities were completed using that money. Even if the original grant proposal did not require benchmarks, it is useful for a city to outline expected accomplishments over the course of the project. Having these benchmarks clearly identified will help a city stay on track and focused. Understanding the importance of documentation brings us to the next big topic related to sustainable economic development and grant administration: Performance Tracking and Reporting.

Performance Tracking and Reports: Program Evaluation and Fiscal Impact Analysis

While the previous sections provide important lessons concerning applying for and administering grants, the following sections highlight performance issues. While these performance measurement tools are useful for a city engaging in grant writing or grant administration, they also are useful for day-to-day administrative duties.

Performance Reports and Information Gathering

While performance reports are an important part of almost all aspects of service delivery in local governments (and are, therefore, important outside of grant administration), they are particularly useful for projects using intergovernmental grant funding. Without a well thought-out plan to track performance and improve programmatic successes, a city or nonprofit agency runs the risk of missing important and valuable opportunities. Without information tracking and document gathering, a grant recipient also runs the risk of being unable to adequately justify and document needs and successes. A city that engages in preplanning and ongoing performance tracking will be in a better position to apply for funding opportunities related to local goals. Additionally, a city that routinely gathers and analyzes performance data will be in a better position to report to federal or state authorities concerning grant program activity. Finally, performance measurement and analysis plays an important role in good and efficient service delivery regardless of the funding source.

Information is of vital importance to any sort of performance tracking and measurement. A city must be prepared to identify and collect the right information on programs and service delivery. In general terms, programs can be evaluated by both their inputs and their outcomes and both should be part of an ongoing information-gathering activity. Inputs, in simplest form, are anything that a program must have and/or use in order to operate. For example, an input might be personnel costs of a program (Berman, 2007). Inputs are often associated with efficiency. Outcomes, on the other hand, are the broader consequences of programmatic activities: intentional and unintentional. An example of an outcome might be lower crime rates as a result of a public safety program (Berman, 2007). Outcomes are often associated with accountability. Outcome measures can tell citizens and granting agencies how well an entity is accomplishing the goals of a specific policy or program.

Both quantitative and qualitative data can serve as important markers for measuring (and improving) performance of a program or service. Common quantitative measures include financial measures of expenditures and revenues, other inputs required for the program (supplies, time, etc.), and outputs of an operating program (brochures, training videos, etc). Qualitative data, on the other hand, is generally explanatory in nature and serves a broader purpose in evaluating needs and programs (Padovani and Young, 2012). Thinking about, and measuring, these aspects of a program will help a city justify grant needs, provide feedback for results achieved as a consequence of a program, and generally improve service delivery and the operation of public programs.

In addition to being concerned with small-scale aspects of a program, such as inputs and outcomes, cities should be concerned with the broader goals of efficiency, effectiveness, and accountability as well. Examining efficiency of a program seeks to answer the questions: How much are we getting for what we are putting in? Is there something we can do different to get more results for the same or even fewer resources? Efficiency is usually measured by taking a combination of input, output, and outcome indicators in conjunction with each other to create a higher scale measure. For example, an efficiency measure might calculate how much a city paid per tree cut down. Simple mathematical operations will give you a figure that can then be tracked over time and potentially compared to other similar cities. Effectiveness and accountability seeks to explore the actual results of the program and tries to answer the question: Are we doing what we said we would do? Often effectiveness is addressed using a benchmark set early in the program's history. For example, a reading program for K12 education might have as a primary goal to ensure 90% of third graders are reading at grade level. Effectiveness then would be considered a success when that 90% was reached (and maintained).

A city looking to develop performance measures for a specific program should first start with the goals they are trying to achieve. Within these programmatic goals will come the ability to identify and measure effectiveness. As just mentioned, benchmarks are useful here. "Benchmarks are standards against which performance

is measured" (Berman, 2007, 66). What is considered successful? At what level are we accountable to the goals we set for this program? Can we set a timetable with progressive quantitative or qualitative goals? While it is important to be ambitious, it is also just as important to be realistic. For example, a teen pregnancy program will likely never reach 100% prevention. Setting a benchmark at a level that is never going to be attainable does not usually serve the best interests of the community. Having benchmarks and goals clearly articulated early in a program can position a city to be better qualified for grant opportunities as they arise. Furthermore, these performance measures can help provide excellent and accountable reports during the active duration of a grant program.

One area of assessing programmatic success for many local administrators is that of information tracking. Key to performance measurement is the systematic and routine collection of data. Unfortunately, many local governments either overlook this or do not feel they have the resources in place to adequately track progress. Good information tracking on public programs is of vital importance to be as successful as possible in sustainable economic development efforts. Without tracking data, it will be impossible to fully know what results a specific program is actually having in a community. Additionally, without good tracking data, it is impossible to make necessary corrections and adjustments as a program progresses. While there is some financial and time cost associated with data collection, the benefits will likely outweigh these costs. Furthermore, ongoing collection may be assisted and cost minimized with an interested intern from a local college or university.

Fiscal Impact Analysis

A special tool of interest to sustainable economic development and assessment is fiscal impact analysis (FIA). FIA has played an important role in many city development decisions since at least the early 1970s (Bise, 2010). FIA is a method of analyzing development options by examining expected changes in revenues and expenditures from new development (or redevelopment) in a city. FIA is often mistaken for an economic impact analysis. However, a key and important difference exists between a FIA and an economic impact analysis (EIA). Specifically, an economic impact analysis looks at the cash flow to the private sector. Conversely, a FIA is interested in the costs and revenues of the public sector as a result of development. These two analysis techniques have been erroneously used interchangeably in some cities (Bise, 2010). While both are important, a FIA can provide information to a city about what it can expect in terms of costs and revenues, not what to expect for the private entity involved. Ultimately, a properly completed fiscal impact analysis will be a very useful tool for a city to use in order to fully understand the benefits and consequences of development, particularly sustainable economic development projects. A FIA can serve as an informational tool for residents, justification for grant applications and grant write-ups, and can help direct scarce

public resources to where they are most needed and would be most beneficial from a public perspective.

FIA models can be useful for both short-term and long-term goals. In the short term, a city can use FIA to gauge what to expect in terms of revenue and expenditures on a specific, individual project that will commence immediately, such as a new housing development being approved. Alternatively, FIA can be used to help guide a long-term comprehensive plan of a city. Furthermore, FIA can be used to project revenue and expenditure impacts on a single project or a comprehensive group of projects (Mucha, 2007). While FIA generally is well received by local administrators, there are some criticisms and shortcomings to this method of analysis. Specifically, some believe this tool does not do enough to take into consideration social or environmental harms from a project and instead relies too heavily on the monetary aspects of a project (Bise, 2010). In reality, this is a common criticism of most analytical tools used in economic development planning. For example, cost-benefit analysis has a long history of criticism for its significant emphasis on monetary impacts. Furthermore, political goals and local ambitions can prevent a FIA from being properly considered; a tool is only as good as the willingness to accept the findings. Additionally, like any analytical tool, the assumptions taken with the calculations will impact the conclusions. Finally, smaller communities may lack the expertise to conduct a comprehensive FIA (Kotval and Mullin, 2006).

Although it is out of the scope of this chapter to provide a comprehensive lesson to the reader on how to conduct a FIA, a brief overview and some extra resources will be highlighted to get the local administrator started on the learning process. In simplest terms, a fiscal impact analysis is seeking to project the "net cash flow to the public sector (the local government and, in many cases, the school district) resulting from new development. …" (Bise, 2010, 4). In order to project the cash flow the researcher will need to measure all of the costs and all of the revenues of a proposed project or projects. There are several ways to measure these expected revenues and costs and all requiring varying levels of expertise and required data availability.

When estimating costs of a project, an average cost method is usually the preferred, and most often used, method due to the ease of application and political acceptability (Kotval and Mullin, 2006). The average cost method "[a]ssumes that the current cost of serving residents and businesses will be equal to the cost of serving the new development" and, therefore, can be used interchangeably to perform calculations (Mucha, 2007). Of course, some level of error should be expected with any method that simply relies on averages of existing development to forecast costs of new development.

Estimating the revenues expected from a project will vary substantially across different localities. How much revenue can be expected will rely heavily on the current revenue and regulatory structure of a particular city. Revenue from a development usually comes from some combination of property taxes, user fees, sales taxes, intergovernmental grant opportunities, and income taxes. In some more advanced FIAs, indirect revenues also are calculated (e.g., sales tax paid by residents of a new

subdivision that was not necessarily directly attributable to the development) (Bise, 2010; Mucha, 2007). Ultimately, after all calculations are complete, a city will have a number that looks something like a net present value (NPV) in a traditional cost-benefit analysis (See Boardman et al. (2011) for an overview of cost-benefit analysis). Generally, a positive number means a project will provide more revenues than costs. A negative number would imply just the opposite.

There are a number of resources available to the city interested in pursuing additional information on this technique. Listed below is a good starting place for that purpose:

1. Bise, L. C. 2010. *Fiscal impact analysis: Methodologies for planners.* Chicago: American Planning Association Press.
2. Burchell, R., D. Listokin, and W. Dolphin. 1985. *The new practitioner's guide to fiscal impact analysis.* Philadelphia: Center for Urban Policy Research.
3. Chervin, S. and R. Kyle. 2009. Economic and fiscal impact analyses, http://www.state.tn.us/tacir/PDF_FILES/Other_Issues/econ_fiscalimpacts.pdf
4. Edwards, M. 2000. Community guide to development impact analysis, http://www.lic.wisc.edu/shapingdane/facilitation/all_resources/impacts/analysis_fiscal.htm
5. Kotval, Z. and J. Mullin. 2006. Fiscal impact analysis: Methods, cases, and intellectual debate. Lincoln Institute of Land Policy, https://www.lincolninst.edu/pubs/dl/1252_Kotval%20Mullin%202%20Final.pdf
6. Watkins, T. Fiscal impact analysis, http://www.sjsu.edu/faculty/watkins/fiscalimpact.htm

FIA in the City of Upper Arlington, Ohio

While there are many examples of the usefulness of fiscal impact analysis, one city—Upper Arlington, Ohio—will be highlighted for illustrative purposes.

Upper Arlington, Ohio, is a relatively small and wealthy community of approximately 34,000 residents. In 1999–2000 "ACP-Visioning & Planning, Ltd. (ACP) led a comprehensive planning process for the City of Upper Arlington. …" (Gross, 2004, 9). Part of this planning process included utilizing fiscal impact analysis to determine how to develop without causing further financial strain on the city. The findings of the FIA enabled the city to know where to direct future growth/development and what types of development serve as a drain on city budgets. For example, it was determined, through FIA, that only office and industrial developments "generate annual net benefits to the local government. Retail use and all of the residential prototypes generate a net loss to local government" (Gross, 2004, 13).

Having this information helps the city of Upper Arlington in a number of ways. First, it allows the city to understand and plan for revenues and costs associated with certain types of developments. Second, it allows a city to have powerful evidence about the sustainability of a given project. Finally, having this information

can provide excellent justification for the pursuit (or denial) of a specific type of development.

Conclusion

Sustainable economic development is often plagued with the fear of the added costs of being protective or concerned with the environment. While it may be true that in some cases sustainability costs more in the short term, it is not always true. A good analysis of each proposed project can help make the cost issue clearer for a city. Without a good, solid evaluation process that may include FIA and program evaluations, a city will not have complete information that is needed for informed decision making. Even if a sustainable project proves to be more expensive than a traditional nonsustainable one, there are many opportunities for funding from state and federal governments that can help ease cost concerns. The key to funding and analysis is to be proactive and deliberate. Finally, persistence can pay off for a city.

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Gross, R. 2004. Resource document: Understanding the fiscal impacts of land use in Ohio, http://www.morpc.org/pdf/fiscalimpacts.pdf

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Mucha, M. 2007. An introduction to fiscal impact analysis for development projects, http://www.gfoa.org/downloads/FinanicalImpactAnalysis.pdf

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Chapter 11

Federal and State Resources for Sustainable Economic Development Efforts

An important part of finding the common ground between economic development and environmental protection involves utilizing resources to help reduce the added costs and miscellaneous burdens of being more environmentally friendly. As discussed in the preceding chapter, many local sustainable economic development efforts can be greatly aided by a variety of federal and state grant programs. The available resources vary in size, qualification requirements, and scope. This chapter will provide an introduction to some of the bigger and more commonly used resources that will be valuable to any local administrator interested in pursuing sustainable economic development.

Federal and State Environmental Remediation/ Redevelopment Programs

As discussed in Chapter 2 of this book, remediation and redevelopment is often one of the first places cities start the process of pursuing sustainable economic development. There is a relatively long history of federal and state programs charged with reducing the burdens associated with remediation and ultimately

redevelopment of contaminated land. As of 2012, the federal government and all 50 states have developed public programs directed at the remediation and redevelopment of environmentally contaminated property. In order to fully understand the complexities behind land contamination, it is first necessary to explore two important federal laws: The Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). After examining these laws, this chapter will turn to some of the primary public programs directed at remediation and redevelopment. This chapter will then move into a discussion of green technology and energy efficiency programs.

RCRA and CERCLA

Presently, hazardous wastes are regulated by the federal and state governments. However, prior to the enactment of RCRA in 1976, only air and water were protected from hazardous waste disposal (Meyer, Williams, and Yount, 1995). With the passage of RCRA in 1976 and CERCLA in 1980, contamination of land became an area where regulation intervened in an effort to protect land from hazardous disposals.

While both RCRA and CERCLA deal with contamination on land, there is an important distinction between the two. RCRA seeks to ensure hazardous wastes are not disposed of improperly, thereby threatening the environment and human health. Conversely, the original language of CERCLA sought to deal with the sites that were abandoned or where the person responsible cannot be found or does not have the capacity to pay for the damages caused. More simply stated, RCRA attempts to **prevent** contamination from ever occurring and CERCLA attempts to **remedy** contamination that already exists.

While RCRA has remained fairly stable over the years, CERCLA has been revised several times since it was first created. One of the most recent, and certainly most important, amendments to CERCLA was the 2002 passage of the Small Business Liability Relief and Brownfields Revitalization Act. This revision worked to shift the focus of CERCLA away from only orphaned sites and develop a framework to assist nonresponsible parties in their remediation and redevelopment efforts. These two federal acts have been very important in the protection and remediation of contaminated sites across the country.

RCRA

RCRA has multiple sections that deal with a variety of issues surrounding the creation, transportation, and ultimately the disposal of hazardous wastes created by public and private entities. Three regulatory programs are established within RCRA: solid waste, hazardous waste, and underground storage tanks (USTs).

Subtitle C, which deals specifically with hazardous wastes, is more related to the issue of contaminated property and remediation needs in the United States

than the other two regulatory programs (although USTs play a close second). This section of RCRA is often called a cradle-to-grave regulatory mechanism because it regulates the entire life cycle of hazardous wastes. RCRA classifies facilities into several different classifications based upon what they do and how much hazardous wastes they produce: treatment, storage, and disposal (TSD); large quantity generators (LQG); small quantity generators (SQG); conditionally exempt small quantity generators (CESQG); and transporters (Opp, 2012). By all measures, the TSD facilities are regulated the most harshly of all types of facilities. TSD facilities must obtain, and periodically renew, a permit under RCRA. These permitted facilities also must demonstrate financial capacity to pay for the closure, cleanup, and postclosure care of their site. This feature is particularly important in the effort to prevent future land contamination that may require remediation. The regulatory assumption is that if a facility has the financial ability to properly close their hazardous waste facility, then abandonment of a contaminated property will be less likely to occur and the burden will not fall to innocent parties.

Under RCRA, all types of facilities are subject to inspection and enforcement actions. These inspections and enforcement efforts are geared to ensuring that hazardous wastes are handled and transported properly. If a violation is discovered, a facility will be required to perform corrective action as part of the enforcement process. In theory, RCRA should work to prevent land contamination from occurring from these hazardous waste producing, transporting, and disposing facilities.

Intergovernmental relationships strongly influence the processes and administration of RCRA. While RCRA is a federal law with the Environmental Protection Agency (EPA) being the lead agency, states are in charge of most of the administration of the program. "When RCRA was written, it was Congress' intent for the states to assume primary responsibility for implementing the hazardous waste regulations, with oversight from the federal government" (U.S. Environmental Protection Agency, 2010). Similar to many environmental programs, states can apply for authority to administer RCRA by enacting a similar hazardous waste program that is at least as stringent as the federal program. Currently, 48 states operate their own base RCRA program. Alaska and Iowa do not currently have any EPA authorizations for the RCRA program (Opp, 2012). As a result of the state administration of the RCRA program, a great deal of variation is seen in minimum requirements and inspection activity of the facilities across the states. Unfortunately, the state level administrative agency's capacity and willingness to properly and comprehensively regulate and inspect the regulated facilities is something that has been called into question in the past (Barnett, 1994).

CERCLA

"After 1980, the history of RCRA became tightly intertwined with that of CERCLA … by and large, RCRA has become the locus of Congress's prevention

concerns, while CERCLA tackles the problems of cleaning up past mistakes. …" (Percival et al., 2006, 320). CERCLA is probably more well known to most people than RCRA. CERCLA established prohibitions and requirements for dealing with brownfields, provided for liability or financial responsibility for contamination, and established a trust fund (Superfund) to finance cleanup where no responsible party could be identified or found.

While CERCLA was certainly a policy that was well intentioned, it has been plagued with many difficulties over the years. Initially, in the early years of CERCLA, courts began broadly interpreting the Act with regard to the "joint and several liability" provision. The interpretation basically meant that each of the responsible parties at a site can be liable for the entire cost of cleanup, so long as the harm caused by each party is indivisible from the harm that other parties caused (Grayson, 1995). Under the original CERCLA regulations, new owners—sometimes not even knowing the contamination existed—could be, and sometimes were, held liable (Coffin and Shepherd, 1998; Ellersbusch et al., 2006; Hodge, 1996).

The aftermath of the liability issues with CERCLA prompted a widespread reluctance by the private sector to engage in investment into properties with perceived contamination. In fact, even financial institutions were reluctant to lend money for remediation/redevelopment projects for fear of becoming liable themselves. "Large cleanup expenses combined with a lack of legal finality leads potential developers and investors to choose uncontaminated suburban land (greenfields) over the more risky brownfields" (Eisinger, 2001, 1). The stigma associated with these properties is certainly one of the biggest reasons why brownfield properties have remained so difficult to develop in many communities.

In more recent years, CERCLA has been amended to try to ease the stigma and liability concerns associated with these properties. First, in 1996 the Asset Conversion, Lender Liability, and Deposit Insurance Protection Act offered lenders liability protections against properties for which they may have provided financing. Then, in 2002, the Small Business Liability Relief and Brownfields Revitalization Act was passed to further ease liability concerns and to encourage redevelopment of the hundreds of thousands of brownfield properties across the United States. Ultimately, more than 30 years has passed since the initial passage of CERCLA and some stigma still remains. The major complaints most people have about CERCLA, as summarized by Percival et al. (2006) include:

- Joint and Several Liability results in unfair allocations of financial responsibility.
- A litigation-driven system funnels too much CERCLA money into transaction costs and too little into site cleanup.
- The cleanup process is too slow and often ineffective.

- Cleanup standards are too stringent; one size fits all health-based standards are inappropriate and impair productive uses of land.
- Where EPA does have discretion, remedies are uneven from site to site.

While CERLCA is intimately connected to the problem of brownfields, there is a very important distinction that must be understood. Technically CERCLA deals with what is commonly referred to as a Superfund Site. There are approximately 1,300 Superfund sites, while there are at least 500,000 brownfields. Superfund sites are listed on the National Priority List (NPL) and undergo a federal cleanup. Brownfields, on the other hand, are generally considered "less" contaminated than CERCLA sites, but, due to the blurry nature of CERCLA, brownfields still carry a great deal of stigma.

RCRA, Superfund, and Brownfields

In principle, RCRA-regulated facilities can become Superfund sites. A RCRA-regulated facility that does not properly close or does not adequately protect the environment and human health can certainly run the risk of becoming a Superfund site. Given that the EPA provides states the authorization to administer the RCRA program, a state failure to properly oversee and enforce their RCRA program also can contribute to land contamination that can become a problem with which the local community must then deal. "State failure to adequately oversee existing facilities and to enforce compliance with regulatory requirements increases the likelihood of groundwater and other environmental contamination" (Barnett, 1994, 88).

While the worst case scenario for a RCRA facility may be to end up as a CERCLA/Superfund Site, the likelihood of that happening is fairly small. Additions to the NPL in recent years have markedly decreased. A failure in the regulatory structure of RCRA is far more likely to impact a state's and city's brownfield problem than the Superfund problem. Unfortunately, as has been pointed out before, "[t]he characteristics and strengths of state Resource Conservation and Recovery Act programs depend on the current activism and political power of affected interests as well as historic patterns of environmental policy making and control" (Barnett, 1994, 89). Huge variations exist across the United States in the stringency of the RCRA program.

While it is important to recognize the interrelated issues that federal and state environmental policies and regulations play on contaminated land in a community, it is just as important to understand the public policies directed at alleviating some of the problems. Currently, the primary public solution to land remediation and redevelopment has been to create and administer state remediation and redevelopment programs. These policies and programs vary substantially and will be outlined in the following section.

Federal and State Programs for Remediation and Brownfield Redevelopment

As mentioned above, CERCLA was revised in 2002. Part of this revision was directed at facilitating the remediation of contaminated properties. In Subtitle A, section 211 of the 2002 Small Business Liability Relief and Brownfields Revitalization Act, several important financial incentives were created. The major components included (U.S. Environmental Protection Agency, 2011):

- Up to $200 million per year for assessment and cleanup costs
- Up to $200,000 per site authorized for inventory and planning activities
- Grants up to $1 million to capitalize a revolving loan fund for remediation activities
- Authorized up to $200,000 per site for remediation activities
- Establishes a program to provide training, research, and assistance directed at assessment and remediation of contaminated properties

Currently numerous grant and funding opportunities exist at the federal level due to this program. A full listing of these funding opportunities can be found at: http://www.epa.gov/brownfields/grant_info/index.htm.

In the past decade, the federal government has played an important role in facilitating the remediation and redevelopment of contaminated property. However, the state governments have played an even larger and potentially more important role in the efforts to remediate and redevelop properties with contamination present. As of 2012, all 50 states have some form of a program that is directed at the remediation and redevelopment of contaminated property. These state programs are more likely than the federal program to provide the needed assistance to local administrators and nonprofit leaders. Some local governments also have created their own remediation and redevelopment programs using federal and state funding opportunities.

State Remediation Programs

Across the 50 states, a great diversity exists surrounding these remediation and redevelopment programs. Some states have only one program, while others have multiple programs. Common features of the state programs include: liability relief for an innocent party, funding opportunities for would-be developers, and technical assistance to interested parties. One of the most common types of brownfield program across the states is a voluntary cleanup program. In fact, 47 of the 50 states have approached brownfield remediation and redevelopment with a voluntary cleanup program. Sometimes this approach is called a Voluntary Remediation or a Voluntary Response Program. However, of the 47 states (Alaska, North Dakota, and South Dakota are the exceptions) with a voluntary cleanup program, all follow

a general pattern: Upon the completion of an agreed-upon cleanup, the voluntary participant receives some sort of liability protection. This policy initiative is directly aimed at reducing the liability concerns associated with CERCLA and state cleanup laws.

Several important differences exist in exactly what a liability protection means across the states. For example, some states allow the responsible party to participate and receive liability protections through the state remediation program. Protection against third-party lawsuits is something that also varies across the states. Specifically, some states will include protections against third-party lawsuits in their liability protections for those completing the state remediation program, while others will not. Finally, another unique and varying aspect of liability protections is that of reopeners. A reopener refers to the process of requiring additional cleanup after a site has been deemed closed. Most states will have provisions that allow for reopeners in the event of newly discovered information or fraud.

In addition to the various liability protections that the state remediation programs offer, financial incentives and varying cleanup standards are key aspects of these programs. First, most of the state funding programs offer some sort of financial considerations to those willing to utilize the programs to remediate contamination. A large percentage of the financial benefits usually comes from the EPA to the state and ultimately to a private developer, city administrator, or nonprofit organization. The most common types of financial incentives offered include:

- **Assessment Grants**: These usually come from an EPA grant that the state was awarded. These grants usually do one of two things: conduct the assessment at the request of a developer or provide funding for the developer to conduct an assessment themselves.
- **Cleanup Grants**: These grants tend to be far less prevalent than the assessment grants. However, when available, these grants will actually provide financial assistance to cover a portion of the actual cleanup costs. Most of these grant programs are directed at local governments and nonprofit organizations.
- **Loan Programs**: Many states offer revolving loan fund (RLF) programs that stem from an EPA capitalization grant. These RLF programs offer low-to-no interest loans to would-be developers of contaminated properties.
- **Tax Incentives**: At least 32 states offer some type of tax incentive for remediation and redevelopment of contaminated properties. These can include tax credits for equipment, sales tax exemptions, property tax abatements, and sliding-scale tax rates on remediated and redeveloped properties.

In addition to the financial incentives another important feature exists in state remediation programs that deals with the level of cleanup required. Specifically the use of risk-based corrective action (RBCA, pronounced Rebecca) and land-use controls (LUC). RBCA is the process by which the parties that are engaging in remediation and redevelopment can tailor the level of cleanup to the intended

end-use. That is, they are able to use a risk-based cleanup standard; the cleanup level required by the state is based on the proposed new development use. More specifically, a site that will ultimately be an industrial development would not require the same level of cleanliness as one that would be developed into a residential community. LUCs are almost always associated with a RBCA-like cleanup process. Land-use controls are essentially any institutional controls that limit the use, exposure, or activity of a given site. For example, a site that was remediated to the level required for an industrial development would likely have restrictions on the property records against redeveloping that site into a residential development. While the use of RBCA and LUCs does not provide money to a developer, they do work to lessen the financial burden on the parties remediating and redeveloping the site. At last count, at least 40 states offered RBCA-like processes for brownfield remediation and redevelopment.

Overall, these remediation and redevelopment programs can be a powerful tool for a city or nonprofit engaging in sustainable economic development. It is important to understand the complex laws, regulations, and opportunities available to those willing to invest in the traditionally undesirable contaminated properties in a community. In many cases, the local government themselves will find that they hold responsibility for remediation and redevelopment of a property by virtue of tax foreclosure. The resources section lists the Web sites for each state's respective brownfields program.

Green Technology and Energy Efficiency

According to the U.S. Bureau of Labor Statistics (2012), green technologies and practice are "… those that reduce the negative impact on the environment or natural resources resulting from the production of any good or service. These technologies and practices include (1) production of green goods and services for use within the establishment, and (2) use of methods, procedures, practices, or technologies that have a positive environmental or natural resource conservation impact." Energy efficiency is one of the most commonly targeted green practices in public programs directed at green technologies. However, unlike the remediation and redevelopment programs profiled in the first part of this chapter, green technology programs are less widespread across the United States.

Technology and economic development are profoundly connected. It has been recognized since at least the industrial revolution that technology growth and development leads to economic growth and development (Koven and Lyons, 2010). Green technology industries are some of the newest and, in some ways, fastest growing industries in the United States. A local government interested in green technology development can proceed as they would for any high-tech development opportunity—examine the city's place in the global marketplace and work on clustering industries (Koven and Lyons, 2010).

In the most recent years, green technology encouragement has been one of the major priorities of the federal government. The American Reinvestment and Recovery Act (Stimulus package) offered approximately $70 billion for green energy and technology investments. Furthermore, many states have created green jobs programs that will have a connection to green technology endeavors. Most, if not all, of the state green energy or green technology jobs programs stem from stimulus money. For example, in 2009, New York State created a program to perform wide-scale energy efficiency audits and to provide workforce development assistance aimed at increasing the supply of skilled workers in green industries (Brookings Institute, 2009).

To be sure, green technology programs have enjoyed some successes in creating jobs. However, some debate exists over whether green jobs will be the answer to the wide-scale economic woes of this country (Green, 2011). Some evidence seems to suggest that jobs created through public green technology programs are primarily for high-skilled specialized engineers, and not for the average American that may be in need of employment opportunities. While this chapter will not engage the very partisan debate over the efficacy of the public programs directed at green technology and green energy jobs, it will offer some advice for those cities interested in pursuing resources for green technology and jobs.

State Energy Efficient Programs

Long before the term *green jobs* became a commonly used term in America, energy efficiency programs were attempting to encourage small businesses, citizens, and local governments to become more energy efficient through the use of technology. State-level programs currently offer grants, loans, and technical assistance to small businesses, citizens, and local governments. Energy efficiency programs are the most common type of green technology program in the states. Most incentives at the state level include some combination of tax deductions or credits, tax holidays, tax exemptions, rebates, grants, and loans.

There are a few good resources to draw upon to find out what programs exist across the states. For information on assistance to small businesses the Small Business Administration hosts a Web site with a listing of all the states' energy efficiency programs: http://www.sba.gov/content/state-and-local-energy-efficiency-programs. This is a great starting place for the local administrator to begin their education on what incentives can help encourage energy efficiency and green technology in their communities. For opportunities specifically directed at local governments and/or the private sector the Database of State Incentives for Renewables and Efficiency is a useful resource: http://www.dsireusa.org/. Another potentially useful resource is located at: http://louisville.edu/cepm/publications/practice-guides-1/PG20%20-%20Matrix.pdf/at_download/file

Important to recognize when thinking about green technology is the fact that traditional economic development is not necessarily the primary benefit to some

of these public programs. For example, energy efficiency programs directed at the local government may actually have a cost savings impact, not an economic development impact. Cost savings to be gained from energy efficiency audits or technology use can allow a local government to redirect money spent on energy costs to other priorities in the community, including economic development.

The International Council for Local Environmental Initiatives (ICLEI), profiles a number of cities deemed to have a "best practices" in place for energy efficiency. For example, Phoenix, Arizona's, energy management program has been "… recognized as one of the most effective in the United States. … Audited savings through the Reinvestment Plan are $18 million" (ICLEI, 2008). The savings and effectiveness of Phoenix's energy efficiency program can be replicated by other municipalities. Some key points and lessons about this program include (ICLEI 2008):

- The city began the program with no project funds the first year.
- In the early years of the program, inexpensive energy controls were installed to minimize costs while still seeing results.
- Key to understanding the scope and successes (or failures) of an energy efficiency program is the accurate accounting of energy use and costs. By fully understanding how much energy is used across the municipal government it will be a lot easier to understand how much is being saved with technology improvements.
- Energy audits were important to saving money in the early years of the program:
  - $150,000 was documented in savings in 1979
  - Savings were able to be reinvested into additional technologies to save energy expenditures
- A Energy Conservation Savings Reinvestment Plan was created to hold up to $500,000 to help municipal departments invest in energy efficient equipment.

Conclusion

A municipality interested in securing assistance with remediation, redevelopment, green technology, or energy efficiency will find a smorgasbord of public programs across the country. While it is not possible to explore all specific programs, lessons and resources highlighted in this chapter can provide a good starting point.

Note

Passages from this chapter appeared in Opp, S. 2009. *Experiences of the States in Brownfields Programs. Environmental Practice*, 11(4): 270–284.

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Chapter 12

Finding Common Ground: Local Economic Development and the Environment

The economy versus the environment debate has raged for decades in academic, policymaking, and practitioner circles. And, unfortunately, the synergies that could be found between the two have been masked by political rhetoric that has gone as far as labeling the Environmental Protection Agency as a jobs killing organization (Chinni, 2011). Public opinion polls suggest that many Americans still view the economy and jobs as competing priorities with environmental protection and regulation (University of Texas, 2012). However, as this book has sought to demonstrate, these concepts do not have to be contradictory, particularly for local economic development efforts in this country.

To be sure, economic activities of the public and private sectors relate to the environment in a number of important ways: (1) natural resources are needed from the environment to produce goods and provide services and (2) environmental harms often stem from traditional consumption and production practices (Church, 1992). Examining the recent history of local economic development reveals a pattern of resource depletion and environmental harms that certainly implies that additional job creation and economic growth requires environmental degradation (or at least is simply ignoring the natural environment). Under this perspective, the race-to-the-bottom theories may be correct: In order to keep mobile capital in a community,

the policymakers and administrators must continue to lower environmental standards to make production (and consumption) as inexpensive for the private sector as possible. Furthermore, some decision-making processes required by many public economic development projects do not adequately consider the future environmental consequences of actions. For example, traditional cost-benefit analysis requires the user to discount future costs and benefits. By treating future generations as "less valued" than current generation, projects that include an environmental harm that is years in the future may appear to be the most-valued project today.

While it is appealing, and perhaps even easy, to subscribe to the economic development versus environmental protection debate, it is very important that policymakers, administrators, and students understand that this distinction is a false dichotomy. In fact, a general guiding principle of the larger sustainable development movement is that it is possible to integrate economic development and environmental protection and be successful (Beder, 2002). According to some sustainable development scholars, success with bridging the gap between the environment and economics simply requires a restructuring of decision-making processes to include the environment in dialogs across all policy areas (European Commission, 2012). To date, European countries have had great successes with environmental policy integration across their cities (Nilsson and Eckerberg, 2009). However, integrating economics and environment does not require American cities to follow the extensive (and sometimes expensive) path of European cities; rather, small changes can make a large difference. Using a *green* lens for economic development activities can help make small changes that encourage economic development and are protective of the natural environment.

Economic Development versus Economic Growth

Something that is often missed from the discussion and debate over economics versus environment is the difference that exists between economic *growth* and economic *development* (Opp, 2008). To many people, economic growth implies a continual need for new and/or expanded private businesses to create additional jobs, revenue, goods, and services. In a prominent economic theory (Ricardian theory), economic growth/progress is measured by quantity of output produced by a specific economy (Kohn, 2009). More simply stated, economic growth requires a continued increase in quality of output from an economy. This growth may deplete natural resources and cause negative environmental externalities in the long term. Referring back to Chapter 4's discussion of transportation planning models helps illustrate the traditional perspective on economic growth. Specifically, the traditional transportation planning paradigm emphasized a linear model (see Figure 4.1) where a continual emphasis on newer and faster automobile transportation was sought. Similar to this transportation planning model, traditional perspectives on economic growth seek a linear growth path—more businesses equal more jobs, and

more revenues. Conversely, economic development is a much broader concept than economic growth. Development is more related to *progress* than to growth (Opp, 2008). Looking to the future requires that we learn from the past and *progress* to a better economic and environmental place in our local policies and practices.

Many development economists, political scientists, and other scholars and practitioners have realized the importance of institutions and environment to economic progress in a community (Kohn, 2009). Clearly, wave three economic development strategies reflect this paradigm shift (see Chapter 1 for a discussion of the three waves of economic development). Furthermore, in the most recent edition of the popular local economic development book by Edward Blakely and Nancey Green Leigh (2010), the authors, for the first time, begin to address sustainability considerations and concerns as they are connected to economic development. Sustainable development policies and goals reflect this changing perception of economic growth and development.

Institutions and Sustainable Economic Development

As discussed in the previous section, academic, economic, and political institutions have continually drawn artificial distinctions between the environment and economic development despite the absolute interconnectedness of the two (MacNeil, 1989, 155). These distinctions have significantly impacted the way governments at the local, state, and federal levels are structured. It is common to find most governmental units with separate agencies for economic development and the environment (Opp, 2005). Similar to a university struggling with interdisciplinary engagement due to academic departments being organized in *disciplinary silos,* this type of structural arrangement makes it difficult to engage across different policy areas and purposes. These structural arrangements have made it nearly impossible to produce systematic and consistent policies with the goals and objectives of finding common ground between sustainability (or the environment) and economic development.

In addition to the consequences of structural organization in a local government, the artificial distinction between the environment and the economy has negative consequences for government policies and practices (MacNeil, 1989, 155). In fact, the policy implications may be more important than the structural issues because policies are backed by large budgets and contribute to the direction a city takes. If economic development funds are allocated in an unsustainable way, no amount of environmental protection or cleanup can compete (MacNeil, 1989, 159). This will be the case unless development policies are reformed.

Almost 25 years ago when Jim MacNeil, Secretary General of the World Commission on Environment and Development, wrote about this topic, his central question was whether economies can be reconfigured to incorporate the values and ideals central to the sustainability movement. The question today is how far has society come in finding the intersection between economic development and sustainability? While the answer is certainly not a resounding affirmation that

sustainability and economic development has been fully and successfully integrated, it is a fact that governments all over the world have come a long way in rejecting the economics versus environment dichotomy.

Experiences with Economic Development and Sustainability

Throughout this volume, many of the chapters have offered the interested practitioner with an overview of both the context and toolkit necessary to find the common ground between local economic development and sustainability. Almost every chapter includes clear examples of localities seeking to amend their practices and policies to achieve an economic development record that reflects the concepts and ideals of sustainability. It is these same cities that have taken the necessary steps to integrate the protection of the environment in other policy areas. Beyond creating the possibility for a sustainable future, these cities have simultaneously been successful at achieving economic development and costs savings through related efforts.

The chapters in Section I (1 through 4) of this book offered readers the basic building blocks of understanding sustainable economic development: built environment issues, energy realities, and transportation planning options. These chapters have illustrated the connection between economic development and environmental quality from a broad perspective. In understanding the effects of past practices, the question begs what would the present look like? Surely in the absence of development policies encouraging and/or subsidizing growth without consideration of their impact on the environment, localities would be less burdened with negative environmental conditions, such as grayfields or brownfields and the associated crime, property valuation issues, and health hazards. Furthermore, had energy resources not been so low cost and readily available, today's built environment would look much different and less harmful to the natural environment. Fortunately, the past need not be a prolog, and the future could look much like the present had we been more thoughtful about the harmful effects of our developmental practices a century or more ago.

Moving forward, rethinking energy's role in economic development is likely going to be among the most important considerations, as costs rise and future availability is questionable. Additionally, transportation will be a key component of any locality's sustainability initiative, as it will continue to be the primary building block for how a city develops and functions. Despite our recent understanding that historical choices in transportation have created problems that local administrators now face, the future is still malleable enough that localities can redesign their transportation systems to avoid the same widespread and significant impacts that these systems have traditionally had on the operation, costs, and form of a city.

Section II of this book offered a more specific look at the tools that can be used to find the common ground between economic development and sustainability.

In Chapter 5, the San Antonio's Mission Verde provides an excellent example of a locality putting together a comprehensive plan for pursuing a sustainable future with a thriving local economy. The introduction of San Antonio's sustainability plan urges all localities to do the same:

> This plan … is based on a simple principle: In meeting our needs today, we cannot compromise the ability of future generations of San Antonians to meet their needs. This is sustainability. It is more than an environmental policy, it is an economic one. Saving energy saves money. Renewable energy creates economic self-reliance. Fewer cars on the road mean less pollution, which carries its own economic costs. A green infrastructure, powered by green technology, creates jobs.
>
> This economic approach runs deep. It is being embraced around the world, from the European Union to China, from Singapore to Dubai. It is driving new technologies, new opportunities, and new jobs. It is … nothing less than the beginning of the Third Industrial Revolution and the future of the U.S. economy. It will be one of the most dramatic economic changes in world history.
>
> San Antonio cannot afford to be left behind. We must invest in green technology, energy conservation, renewable energy, efficient transportation, and smarter buildings. We must build a new energy infrastructure that transforms our city from reliance on centralized power to distributed power. We must create a multimodal transportation system that is integrated and efficient. We must bring venture capital to invest in new green businesses and technology. We must conserve, create, and grow.

Following from the example that San Antonio set for other communities, the other chapters in Section II of this book offer in-depth looks at four easily adaptable tools for sustainable economic development.

While much remains to be done, this book demonstrates that the current economic development toolkit can be adapted into one that takes into consideration the goals of sustainability. Integrating sustainability goals into economic development can offer great successes in both policy areas. The final pages of this chapter conclude this book with a broader examination and review of the common strategies and challenges associated with the transformation of economic development activities into something more sustainable.

Strategies for Sustainable Economic Development

Much of the transformation or repurposing of the current economic development toolkit has focused on four strategies (Nixon and Weiss, n.d., 3):

1. Green savings: The demand side of the market, including products and services
2. Green opportunities: The supply side of the market
3. Green talent: The human resources who can effect change
4. Green places: The geographic dimension of the market

All four of these strategies can be useful for cities across the United States and are reflected in the chapters of this book.

Green savings-centered strategies are aimed at increasing efficiencies throughout organizations, such as local businesses and public agencies. While these strategies are not implicitly directed at creating jobs or additional revenue, they have the end result of saving money for the municipality. These strategies are generally broadly focused on conserving energy and resources, reducing waste, and enacting reforms that bring high return on investments (Nixon and Weiss, n.d., 4). Examples of this approach have included commercial or residential retrofits, such as the ones discussed in the case study profiled in Chapter 7 on university–community partnerships. The biggest positive side to these strategies is the money and resources saved in day-to-day operations.

Green opportunities focus on generating an environment that is friendly toward economic development. A locality can promote business and create jobs by making the conditions right for increasing the number of local companies that are involved with the production of green goods and services. It is necessary to ensure that the economic and social climate is friendly toward business creation and retention so that green businesses will want to put down roots in the community (Nixon and Weiss, n.d., 5). Portland, Oregon's, example in Chapter 3 provides an excellent example of this concept in action.

The third strategy area in which a locality may seek to encourage sustainable economic development focuses on the workforce side of economic development. Specifically, this strategy area seeks to create a pool of green talent from which companies can draw on to staff the emerging green industry. This can include investing in education, research, and innovation (Nixon and Weiss, n.d., 5). Without qualified employees, green technology firms will be dissuaded from setting up shop in a specific community. Chapters 6 and 7 highlight this concept in action.

The last broad sustainable economic development strategy is green places. These are places that promote the principles of sustainability, such as mixed-use, low-impact neighborhoods, public transportation, and green energy. These qualities make communities desirable because they increase livability (Nixon and Weiss, n.d, 5). Examples of this approach were extensively highlighted in Chapter 2. These techniques are very much in line with the wave three economic development strategies that call for an emphasis on quality of life.

Key Challenges and the Future

In the most recent years, the United States' economy has been struggling with a slow recovery from the *Great Recession*. Empirical evidence implies that during this time of sluggish economic recovery many cities have returned to some of the most controversial and detrimental economic development strategies. Specifically, cities have increased incentives and regressed in their willingness to analyze the costs and benefits of incentives designed to create jobs and revenues (Osgood, Opp, and Bertnosky, 2012; Zheng and Warner, 2010). Unfortunately, desperation for revenues and employment may lead some localities to scrap sustainability efforts and return to the previous practices of attracting new businesses at all costs. The increasing reliance on early economic development strategies with a proven track record of having significant negative side effects has far-reaching consequences for localities and is not necessary even in the face of economic hardship.

The environment is a nonrenewable resource and it is likely that at some point in the future, most of the energy sources society has come to rely on will have disappeared. Communities that continue to allow for development on greenfields will eventually exhaust all previously unused space and will have to confront the consequences of those decisions. If society is to cast off the artificial distinctions of yesterday, localities will need to make environmental considerations part of their economic development efforts and their decision-making processes. Perhaps the local administrator reading this book can begin the process by simply considering and perhaps integrating environmental discussions within broader economic development efforts. In this way, the ultimate goal of having a cohesive and integrative economic development and environmental protection plan will not seem so daunting. None of the tools and case studies in this chapter required significant deviations from standard practices, they just required an integrated decision-making and thought process on the part of participants.

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Nixon, J. H., and M. Weiss. n.d. *Sustainable economic development strategies.* Washington, D.C.: Global Urban Development.

Opp, S. 2005. *Location, location, location: Brownfields program placement in local governments*. Louisville, KY: University of Louisville, Southeast Regional Environmental Finance Center, Center for Environmental Policy and Management, http://cepm.louisville.edu/Pubs_WPapers/practiceguides/PG11.pdf

Opp, S. 2008. Roles and realities. In *Local sustainable urban development in a globalized world*, eds. L. Heberle and S. Opp. Aldershot, U.K.: Ashgate.

Osgood, J., S. Opp, and L. Bertnosky. 2012. Yesterday's gains vs. today's realities: Lessons from ten years of economic development practice. *Economic Development Quarterly* 26(4): 334–350.

University of Texas. 2012. Energy Poll, March. http://www.utenergypoll.com/

Zheng, L., and M. Warner. 2010. Business incentive use among U.S. local governments: A story of accountability and policy learning. *Economic Development Quarterly* 24 (4): 325–336.

Appendix

Resource Guide

Clean Energy Resources

Additional Reading

Geller, H. 2003. *Energy revolution: Policies for a sustainable future*. Washington, D.C.: Island Press.

Gerrand, M. (ed). 2011. *The law of clean energy: Efficiency and renewables*. Chicago: American Bar Association.

Pernick, R., and C. Wilder. 2007. *The clean tech revolution: The next big growth and investment opportunity.* New York: HarperCollins Publishers.

Tester, J., E. Drake, M. Driscoll, and W. Peters. 2005. *Sustainable energy: Choosing among options*. Cambridge: MIT Press.

Web Resources/Organizations

American Wind Energy Association, http://www.awea.org/
Offers education resources, a schedule of events, and information about wind energy in the United States.

Clean Energy Alliance. http://www.cleanenergyalliance.com/
This organization of nonprofits focuses on cleantech commercialization. Provides members with resources to support clean energy and entrepreneurship.

Clean Energy Supercluster, Colorado State University, http://energy.colostate.edu/
This provides information on the interdisciplinary research, outreach, and technology efforts at Colorado State University. Research and commercialization information is available.

Getting Prepared: Economic Development in a Transforming Energy Economy, http://www.iedconline.org/downloads/energyreport/IEDC_Getting_Prepared_Full.pdf

Southern Alliance for Clean Energy, http://www.cleanenergy.org/

This organization of communities and people in the southeast region of the United States offers research, news, and information on clean energy initiatives and policies.

Union of Concerned Scientists: Citizens and Scientists for Environmental Solutions, http://www.ucsusa.org/clean_energy/

This Web site offers education and solutions dealing with clean energy.

U.S. Environmental Protection Agency, http://www.epa.gov/cleanenergy/

This Web site profiles EPA's Clean Energy Programs. Education and resources are available at this Web site.

The White House, http://www.whitehouse.gov/energy

This Web site offers an overview of clean energy as a policy priority for the federal government.

Eminent Domain Resources

Additional Reading

Burke. B. 2009. *Understanding the law of zoning and land use controls*. Newark, NJ: LexisNexis.

Opper, R. 2005. Eminent domain in brownfield redevelopment. *EHS Strategies* 2005: 7–28.

Web Resource/Organizations

International Economic Development Council. 2006. Eminent domain resource kit, http://www.iedconline.org/Downloads/Eminent_Domain_Kit.pdf

National Conference on State Legislatures, http://www.ncsl.org/issues-research/env-res/eminent-domain-overview.aspx

This Web site includes an overview of eminent domain, a summary of the *Kelo v. New Haven* Supreme Court decision, information on state legislation and ballot measures, and a presentation on the topic of eminent domain.

Energy Efficiency Resources

Additional Readings

Environmental Protection Agency (EPA). 2011. Why buy green power? http://www.epa.gov/oaintrnt/greenpower/buy.htm

Environmental Protection Agency (EPA). 2009. Re-powering America's land, http://www.epa.gov/oswercpa/docs/success_maytag_ia.pdf.

Environmental Protection Agency (EPA). 2007. Hydroelectricity, http://www.epa.gov/cleanenergy/energy-and-you/affect/hydro.html

Web Resources/Organizations

Database of State Incentives for Renewables and Efficiency, http://www.dsire-usa.org/

Provides a comprehensive resource for further information on state, local, utility, and federal incentives directed at renewable energy and energy efficiency.

Energy Star, http://www.energystar.gov/

Energy star is a joint program shared between the Environmental Protection Agency and the Department of Energy. The program educates and provides guidance on energy efficiency.

Scaling Up Building Energy Retrofitting in U.S. Cities, http://www.iscvt.org/who_we_are/publications/Green_Boot_Camp_Resource_Guide.pdf

Small Business Administration, State and Local Energy Efficiency Programs, http://www.sba.gov/content/state-and-local-energy-efficiency-programs

This Web site offers a comprehensive listing of state, local, and regional programs directed at assisting businesses to become energy efficient.

U.S. Department of Energy: Weatherization and Intergovernmental Program, http://www1.eere.energy.gov/wip/sep.html

Provides information on the state energy program that provides grants and technical assistance related to energy.

Environmental Remediation Resources

Additional Reading

Fitzgerald, J., and N. G. Leigh. 2002. *Economic revitalization: Cases and strategies for city and suburb.* Thousand Oaks, CA: Sage Publications.

Greenberg, M., and M. Lewis. 2000. Brownfields redevelopment, preferences and public involvement: A case study of an ethnically mixed neighborhood. *Urban Studies* 37 (13): 2501–2514.

Kibel, P. 2003. City soil: Urban brownfields as affordable housing sites. *Shelterforce* 130, July/August.

Leigh, N. 2000. *Promoting more equitable brownfield redevelopment: Promising approaches for land banks and other community land development entities.* Cambridge, MA: Lincoln Institute for Land Policy.

Morrison, D., and K. Hanks. 2003. *Local government and community engagement in brownfields redevelopment.* Washington, D.C.: ICMA Press.

Russ, T. 1999. *Redeveloping brownfields: Landscape architects, planners, developers.* New York: McGraw-Hill.

Wagner, D., and R. Dhesi. 2002. *Growing greener: Revitalizing brownfields into greenspace.* Washington, D.C.: ICMA Press.

Web Resources/Organizations

Center for Creative Land Recycling, http://www.cclr.org/resources

This organization uses EPA funding to provide technical assistance and training to communities with land contamination issues.

Center for Environmental Policy and Management, University of Louisville, cepm.louisville.edu

CEPM is a research center located at the University of Louisville. This research center provides a variety of research papers, guides, and presentations related to applied environmental policy.

Environmental Law Institute, http://www.eli.org/Program_Areas/petroleum_brownfields_resource_center.cfm

The environmental law institute is a nonprofit and nonpartisan research and education center focused on the environment and economic development.

Great Lakes Commission, http://www.glc.org/bridges/brownfields.html

This organization is made up of several states in the region surrounding the Great Lakes. The group seeks to promote environmental protection and conservation of the resources in the region. The organization includes a number of resources related to remediation.

International Economic Development Council, http://www.iedconline.org/?p=Brownfields_Resource_Center

This organization offers several useful documents related to brownfields remediation and redevelopment.

Lincoln Institute of Land Policy, http://www.lincolninst.edu/

Provides many resources for issues relating to the use, regulation, and taxation of land. Publications, news, education, and research are all featured on this Web site.

Municipal Research and Services Center of Washington, http://www.mrsc.org/subjects/environment/brownfields.aspx

This organization is a private, nonprofit organization located in Washington State. Although the organization has a primary focus on issues within Washington state, most of the research and information is translatable to other states.

The Northeast-Midwest Institute, nemw.org

NEMW is a nonprofit, nonpartisan research organization with a variety of reports and analysis related to environmental issues.

State Brownfield Programs

Table A.1 State Brownfield Program Internet Locations

State Agency Name, Web Site
Alabama Department of Environmental Management http://adem.alabama.gov/programs/land/brownfields.cnt
Alaska Department of Environmental Conservation http://dec.alaska.gov/spar/csp/brownfields.htm
Arizona Department of Environmental Quality http://www.azdeq.gov/environ/waste/cleanup/brownfields.html
Arkansas Department of Environmental Quality http://www.adeq.state.ar.us/hazwaste/bf/default.htm
California Environmental Protection Agency http://www.calepa.ca.gov/brownfields/
Colorado Department of Public Health and Environment http://www.cdphe.state.co.us/hm/rpbrownfields.htm
Connecticut Department of Energy and Environmental Protection http://www.ct.gov/dep/cwp/view.asp?a=2715&q=324930
Delaware Department of Natural Resources and Environmental Control http://www.dnrec.delaware.gov/whs/awm/SIRB/Pages/Brownfields.aspx
Florida Department of Environmental Protection http://www.dep.state.fl.us/waste/categories/brownfields/default.htm
Georgia Department of Natural Resources http://www.gaepd.org/Documents/brownfields.html
Hawaii Department of Health http://hawaii.gov/health/environmental/hazard/brownfields.html
Idaho Department of Environmental Quality http://www.deq.idaho.gov/waste-mgmt-remediation/brownfields.aspx
Illinois Environmental Protection Agency http://www.epa.state.il.us/land/brownfields/

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Table A.1 State Brownfield Program Internet Locations (continued)

State Agency Name, Web Site
Indiana Finance Authority http://www.in.gov/ifa/brownfields/
Iowa Economic Development http://www.iowaeconomicdevelopment.com/business/brownfields.aspx
Iowa Department of Natural Resources http://www.iowadnr.gov/InsideDNR/RegulatoryLand/ContaminatedSites/Brownfields.aspx
Kansas Department of Health and Environment http://www.kdheks.gov/brownfields/index.html
Kentucky Department for Environmental Protection http://dca.ky.gov/brownfields/Pages/default.aspx
Louisiana Department of Environmental Quality http://www.deq.louisiana.gov/portal/PROGRAMS/BrownfieldsandVoluntaryRemediationProgram.aspx
Maine Department of Economic and Community Development http://www.maine.gov/decd/meocd/other_programs/brownfield.shtml
Maine Department of Environmental Protection http://www.maine.gov/dep/spills/brownfields/
Maryland Department of the Environment http://www.mde.state.md.us/programs/Land/MarylandBrownfieldVCP/Pages/programs/landprograms/errp_brownfields/draft_sites.aspx
Massachusetts Department of Environmental Protection http://www.mass.gov/dep/cleanup/brownfie.htm
Michigan Department of Environmental Quality http://www.michigan.gov/deq/0,1607,7-135-3311_4110— -,00.html
Minnesota Pollution Control Agency http://www.pca.state.mn.us/index.php/waste/waste-and-cleanup/cleanup-programs-and-topics/cleanup-programs/brownfields.html?menuid=&redirect=1

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Table A.1 State Brownfield Program Internet Locations (continued)

State Agency Name, Web Site
Mississippi Department of Environmental Quality http://www.deq.state.ms.us/MDEQ.nsf/page/GARD_brownfields?OpenDocument
Missouri Department of Natural Resources http://www.dnr.mo.gov/env/hwp/bvcp/hwpvcp.htm
Montana Department of Environmental Quality http://deq.mt.gov/brownfields/default.mcpx
Nebraska Department of Environmental Quality http://www.deq.state.ne.us/
Nevada Department of Conservation and Natural Resources http://ndep.nv.gov/bca/brownfld.htm
New Hampshire Department of Environmental Services http://des.nh.gov/organization/divisions/waste/hwrb/sss/brownfields/index.htm
New Jersey Department of Environmental Protection http://www.nj.gov/dep/srp/brownfields/
New Mexico Environment Department http://www.nmenv.state.nm.us/gwb/NMED-GWQB-Brownfields.htm
New York Department of Environmental Conservation http://www.dec.ny.gov/chemical/brownfields.html
North Carolina Department of Environment and Natural Resources http://portal.ncdenr.org/web/wm/bf
North Dakota Department of Health http://www.ndhealth.gov/wm/brownfields/
Ohio Environmental Protection Agency http://www.epa.ohio.gov/derr/SABR/sabr.aspx
Oklahoma Department of Environmental Quality http://www.deq.state.ok.us/lpdnew/brownfindex.html

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Table A.1 State Brownfield Program Internet Locations (continued)

State Agency Name, Web Site
Oregon Department of Environmental Quality http://www.deq.state.or.us/lq/cu/brownfields/index.htm
Pennsylvania Department of Environmental Protection http://www.portal.state.pa.us/portal/server.pt/community/brownfield_redevelopment/10306
Rhode Island Department of Environmental Management http://www.dem.ri.gov/brownfields/
South Carolina Department of Health and Environmental Control http://www.scdhec.gov/environment/lwm/html/brownfields.htm
South Dakota Department of Environment and Natural Resources http://www.scdhec.gov/environment/lwm/html/brownfields.htm
Tennessee Department of Environment and Conservation http://www.tn.gov/environment/dor/brownfields.shtml
Texas Commission on Environmental Quality http://www.tceq.texas.gov/remediation/bsa/bsa.html
Utah Department of Environmental Quality http://www.superfund.utah.gov/vcp.htm
Vermont Department of Environmental Conservation http://www.anr.state.vt.us/dec/wastediv/sms/brownfields-home.htm
Virginia Department of Environmental Quality http://www.deq.state.va.us/Programs/LandProtectionRevitalization/RemediationPrograms.aspx
Washington Department of Ecology http://www.ecy.wa.gov/programs/tcp/brownfields/brownfields_hp.html
West Virginia Department of Environmental Protection http://www.dep.wv.gov/dlr/oer/voluntarymain/Pages/default.aspx
Wisconsin Department of Natural Resources http://dnr.wi.gov/org/aw/rr/

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Table A.1 State Brownfield Program Internet Locations (continued)

State Agency Name, Web Site
Wyoming Department of Environmental Quality
http://deq.state.wy.us/volremedi/brownfields.asp

Grant/Funding Resources

Web Resources/Organizations

Economic Development Administration, http://www.eda.gov/ffo.htm

Provides federal funding opportunities from the economic development administration.

Foundations Center, http://foundationcenter.org/

Provides a searchable database of foundations that provide grant support.

Grant Professionals Association, http://grantprofessionals.org/

Is the premier organization for professionals working in grant writing and grant administration. Provides some training and assistance opportunities.

Grant Station, http://www.grantstation.com/

Provides an online resource for grant opportunities throughout the world.

Grantmanship Center, http://www.tgci.com/index.shtml

Provides assistance through training, consulting, and outreach for entities looking to apply for grant opportunities.

Health and Human Services, http://dhhs.gov/asfr/ogapa/index.html

Provides a variety of resources directed at the acquisition and administration of grants.

National Agricultural Library, Department of Agriculture, http://ric.nal.usda.gov/funding-resources

Provides funding resources for rural areas.

Office of Faith Based and Neighborhood Partnerships, http://www.whitehouse.gov/administration/eop/ofbnp/resources

Does not provide direct grant opportunities, but provides information to community based organizations interested in federal funding opportunities.

Office of Management and Budget Federal Grants Management, http://www.whitehouse.gov/omb/grants_default

Does not directly provide grants, but does provide management resources for federal grants. The OMB is the lead entity in ensuring federal grants are spent properly. Procurement policies, administrative requirements, and e-gov information is all available through the OMB.

USA Spending, http://www.usaspending.gov/
Searchable database of federal financial awards since 2011.

Green Jobs

Additional Reading

Houser, T., M. Shashank, and R. Heilmayr. 2009. *A green global recovery? Assessing U.S. economic stimulus and the prospects for international coordination*. Washington, D.C.: World Resources Institute, February.

Jones, V. 2008. *The green collar economy: How one solution can fix our two biggest problems.* New York: Harper Collins.

Web Resources/Organizations

Bureau of Labor Statistics: Measuring Green Jobs, http://www.bls.gov/green/

Creating an Environment for Growing Green Jobs: Community Colleges Shaping State and Local Energy Policies, http://theseedcenter.org/Resources/SEED-Resources/AACC-s-SEED-Green-Action-Plan-Series/AACC-SEED-Policy-Action-Plan.pdf

Green Economy Is a Growth Economy: How Green Building Supports Jobs Creation, Workforce Transformation and Recovery, https://www.usgbc.org/ShowFile.aspx?DocumentID = 10759

Promising Practice in Green Job Creation, http://www.iscvt.org/who_we_are/publications/Green_Jobs_Resource_Guide.pdf

Public–Private Partnerships

Additional Reading

Brown, K. 2007. Are public-private transactions the future of infrastructure finance? *Public Works Management and Policy* 12: 320–324.

Miles, M., G. Berens, M. Eppli, and M. Weiss. 2007. *Real estate development: Principles and process.* Washington, D.C.: Urban Land Institute.

Rosenau, P. (ed). 2000. *Public–private policy partnerships*. Cambridge, MA: MIT Press.

Sagalyn, L. 2007. Public/private development: Lessons from history, research, and practice. *Journal of the American Planning Association* 73 (1): 7–22.

Savas, E. 2000. *Privatization and public–private partnerships.* New York: Chatham House.

U.S. Department of Transportation. 2009. Public policy considerations in public-private partnership (ppp) arrangements, http://www.fhwa.dot.gov/ipd/pdfs/2009_public_policy_considerations_ppp_arrangements.pdf

Web Resources/Organizations

National Council for Public-Private Partnerships, http://www.ncppp.org/index.shtml

This nonprofit, nonpartisan organization provides education, training, and resources to the public and private sectors interested in engaging in PPPs.

PPP in Infrastructure Resource Center, http://ppp.worldbank.org/public-private-partnership/

Provides a world bank resource for using PPPs in infrastructure. Resources are available to help deal with contracts, laws, and regulations relating to PPPs. Sample PPP agreements and concession documents, checklists, and sample documents are all available.

Project Finance Portal, Harvard Business School, http://www.people.hbs.edu/besty/projfinportal/

This Web resource serves as a reference guide on project finance, infrastructure finance, and PPPs. The intended audience is practitioners, students, and researchers.

U.S. Department of Transportation, Innovative Program Delivery, http://www.fhwa.dot.gov/ipd/p3/defined/index.htm

Sustainable Development Resources

Additional Reading

Anglin, R. V. 2011. *Promoting sustainable local and community economic development*. Boca Raton, FL: CRC Press.

Galpin, T., J. Whittington, and R. Bell. 2012. *Leading the sustainable organization*. New York: Routledge.

Hawken, P. 1994. *The ecology of commerce*. New York: Harper Collins.

Heberle, L., and S. Opp (eds.) 2008. *Local sustainable urban development in a globalized world*. Aldershot, U.K.: Ashgate.

Mazmanian, D., and M. Kraft. 2009. *Toward sustainable communities: Transition and transformations in environmental policy*. Cambridge, MA: MIT Press.

Nilsson, M., and K. Eckerberg. 2009. *Environmental policy integration in practice*. London: Earthscan.

Piedmont-Palladino, S., and T. Mennel. (eds.) 2009. *Green community*. Washington, D.C.: American Planning Association.

Slavin, M. (ed). 2011. *Sustainability in America's cities*. Washington, D.C.: Island Press.

Wheeler, S., and T. Beatley (eds.) 2009. *The sustainable development reader*. New York: Routledge.

Web Resources/Organizations

American Society of Landscape Architects, http://www.asla.org/ContentDetail.aspx?id=23720

Offers a compilation of additional sustainable development resources useful for urban development.

Guidebook: Community-Based Approach to Education for Sustainability, http://www.iscvt.org/who_we_are/publications/Education%20for%20Sustainability%20Guidebook.pdf

Gulf Coast Sustainable Economies Leadership Academy, http://www.iscvt.org/who_we_are/publications/GCLA_Resource_Guide.pdf

ICLEI: Local Governments for Sustainability, http://www.iclei.org/

An association of local governments committed to sustainable development. Projects include climate, procurement, water, sustainability, and biodiversity.

Interfaith Center on Corporate Responsibility, http://www.iccr.org/issues/subpages/ssrg.php

A resource guide directed at explaining the social impacts of corporate practices with an emphasis on sustainability.

Institute for Sustainable Communities, http://www.iscvt.org

Provides an extensive library of publications ranging from Climate Leadership Academy Resource Guides to education for sustainability.

Living Cities, www.livingcities.org/knowledge/media/?action=download&id=15

Offers an overview and advice for local communities wishing to engage in sustainable development.

Renkei: Demonstrating Education for Sustainability through Community Partnerships, http://www.iscvt.org/who_we_are/publications/

Sustainable Communities Boot Camp Resource Guide, http://www.iscvt.org/who_we_are/publications/SCBC_Resource_Guide.pdf

Sustainable Economic Development Network, http://www.sednetwork.net

Provides individuals and localities with a litany of resources, including information on best practices for sustainable economic development.

Sustainable Economic Development: Initiatives, Programs, and Strategies, http://www.globalurban.org/Sustainable%20Economic%20Development.pdf

Sonoran Institute, http://www.sonoran.org/

Offers sustainable development assistance to communities in the western region of the United States.

United Nations Development Programme, http://www.undp.org/content/undp/en/home/librarypage/environment-energy/sustainable_energy/energy_and_genderforsustainabledevelopmentatoolkitandresourcegui.html

This Web site provides a toolkit and resource guide for information on energy and gender as it relates to sustainable development.

Urban Sustainability Leadership Academy: Creating, Leading & Managing Change, http://www.iscvt.org/who_we_are/publications/USLA_Resource_Guide.pdf

Tax Increment Financing Resources

Additional Reading

Council of Development Finance Agencies. 2008. Recommended practices: Effective tax increment finance program management, http://www.cdfa.net/cdfa/cdfaweb.nsf/ord/recpracTIF.html/$file/Recommended_Practices_Effective_Tax_Increment_Finance.pdf

Council of Development Finance Agencies. 2008. Original research: 2008 TIF state-by-state report, http://www.cdfa.net/cdfa/cdfaweb.nsf/0/8ee94afeece08bc988257936006747c5/$FILE/CDFA-2008-TIF-State-By-State-Report.pdf

Council of Development Finance Agencies and International Council of Shopping Centers (CDFA and ICSC). 2007. Tax increment finance best practices reference guide, http://www.icsc.org/government/CDFA.pdf

Dye, R., and F. Merriman. 2006. Tax increment financing: A tool for local economic development. *Land Lines* 18 (1): 1–18.

Web Resources/Organizations

Council of Development Finance Agencies, http://www.cdfa.net

This organization and its Web site provide useful information on a number of financing mechanisms to assist in pursuing sustainable economic development. They also offer education and programming related to tax increment financing, municipal bonds and public–private partnerships.

University–Community Partnership and Sustainability Resources

Additional Reading

Bridger, J., and T. Alter. 2006. The engaged university, community development, and public scholarship. *Journal of Higher Education Outreach and Engagement* 11 (1): 163–177.

Bruning, S., S. McGrew, and M. Cooper. 2006. Town-gown relationships: exploring university–community engagement from the perspective of community members. *Public Relations Review* 32: 125–130.

Curry, J. 2002. The development of an ethic of service to a place. In *Commitment and connection: Service-learning and christian higher education*, eds. G. Gunst Heffner and C. DeVries Deversluis (pp. 167–181). Lanham, MA: University Press of America.

Holland, B., S. Gelmon, L. Green, E. Greene-Moton, and T. Stanton. 2003. Community–university partnerships: What do we know? Paper presented at the National Symposium on Community–University Partnerships sponsored by Community–Campus Partnerships for Health and HUD's Office of University Partnerships, August 30, http://depts.washington.edu/ccph/pdf_files/symposium_report.pdf

Heffner, G., and C. Beverslius (eds.) 2002. *Commitment and connection: Service- learning and christian higher education*. Lanham, MA: University Press of America.

Hirokawa, K., and J. Rosenbloom. 2011. *Town, gown and place-based sustainability: Collaborating in the shared space*. Albany, NY: Albany Law School Legal Studies Research Paper Series No. 37 of 2011-2012.

Kasper, H. 2002. The changing role of community college. *Occupational Outlook Quarterly* 43 (4): 14–21.

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Web Resources/Organizations

International Town & Gown Association, http://www.cdfa.net

This organization and its Web site provide useful information on bridging colleges and universities and their communities. The Web site includes a deep set of resources in its College Town Resource Center, including best practices on how to foster and sustain university–community partnerships.

PUBLIC ADMINISTRATION

A clear and practical examination of complex issues, **Local Economic Development and the Environment: Finding Common Ground** provides a broad, academic look at the intersection of two important areas for local administrators. In addition to managing development in a strained economic climate, most administrators are also expected to be stewards of the environment. However, economic conditions often leave them with limited options for pursuing economic development and, at the same time, being environmentally mindful. Many find themselves without a clear understanding of the concepts, tools, and best practices available to accomplish this herculean task.

FEATURES

- Translates complex environmental and economic concepts into easily applicable practices
- Gives practitioners the information they need to communicate with consultants, constituents, and officials, and to avoid ideological obstacles
- Compares regulatory differences between states and other geographical differences
- Includes examples from across the country to highlight variations in environmental regulations and laws
- Provides technical, legal, and political insights into the process of pursuing local economic development projects that incorporate protection and awareness
- Contains case studies that demonstrate the concepts in action, allowing readers to fully grasp the complexities associated with sustainable economic development
- Discusses how local administrators can balance the economic and environmental needs of the future

Bridging the gap between policy-making intention and outcome, this book connects readers with a larger body of research that not only underpins practical applications but also helps them avoid legal, technical, and political obstacles. It provides an arsenal of best practices and everyday, easy-to-use strategies for optimizing the difficult balance between economic development and environmental protection.

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