Stewardship of the Built Environment

Robert A. Young

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Stewardship of the Built Environment

*Sustainability,
Preservation,
and Reuse*

Robert A. Young

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I dedicate this book to my late father,
Raymond W. Young,
who taught me more about sustainability than
either of us could have ever realized at the time.

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Foreword

Each generation faces a changed and changing world. Even with the benefit of history's lessons, it is difficult to grasp patterns in the chaotic blur of events that rush past. It is an even greater challenge to know with any certainty which patterns signal the trends that define our times.

Today, there is nearly unanimous agreement that the defining pattern of the present is globalization. Worldwide economic, environmental, and cultural factors are interconnected in complex networks that resist comprehension.

The reach of the global economy is nearly inescapable. Investors are routinely required to exercise intestinal fortitude as the rise and fall of the Dow is pegged to events like the Greek debt crisis. While economies around the world still depend on the appetite of American consumers, Detroit automakers, rescued from the brink of bankruptcy, have garnered record profits largely from sales in the emerging markets of Brazil, China, and India.

Yet few have taken notice of a fundamental shift in global economic activity to a *restorative* mode, wherein the drive for expansion has been overtaken by the need to mitigate, adapt, and renew. Regarding the built environment, the shift has been far from subtle. Economic projections forecast that in the United States the value of building reuse and modernization will be double that of new construction over the next two decades.

In the context of this global shift to a restorative and sustainable economic mode, understanding what is of real and lasting value has the greatest importance. For those unfamiliar with the field, it may come as quite a revelation that the principles and disciplines of historic preservation hold the key. For those within the field, it may be an equivalent awakening to understand that the achievements of historic preservation have relevance in a much, much, wider world.

Over the past fifty years, the historic preservation field has defined a scalable model of sustainable economics. Historic preservation is founded on the principle that conservation comes first. Extending the useful service life of an existing building also extends the benefit derived from the investment of dollars,

materials, and energy that went into its creation. Preservation activities tend to require relatively modest commitments of material and energy resources while demanding great skill and craft. Translated into the terminology of sustainable economics, historic preservation presents an ideal of steady jobs with good wages, cycles dollars through the local economy, and minimizes the depletion of resources. There is much to be learned from preservation economics.

The parallels between economic and environmental factors are apparent. By conserving what already exists, historic preservation improves the cost-benefit equation for past resource use and avoids expenditures in the present day. Curtailing the demand for material and energy resources reduces the environmental impact of constructing, maintaining, and operating buildings, towns, and cities.

Contributions of the building sector to resource depletion, environmental degradation, and greenhouse gas emissions are well documented. This data forms the foundation upon which the green building industry has been erected. However, even after more than a decade of concentrated effort to educate, advocate, and collaborate, the role of historic preservation in defining a sustainable future remains largely overlooked. From the perspective of historic preservation, the emerging pattern is clear. We cannot build our path to a sustainable future; we must conserve our way to it. The *greenest* building *really* is one that is already built!

From the outset, the international discourse on sustainable development focused in large part on its societal and cultural dimensions. Motivated by inequities between industrialized nations and those nations whose resources are exploited to stoke the engines of commerce, the principles of sustainability have been shaped by fairness and value viewed through the lens of culture. Despite this, social and cultural factors have been given short shrift in the building sector. The materiality of bricks and mortar seems to block out sensibilities needed to address the *softer* considerations of culture.

Historic preservation is the exception. To me, the greatest delight in practicing historic preservation architecture is that cultural value is placed on an equal footing with material value. Procedures for identifying and assessing historic and cultural significance are established as clearly as those for determining the integrity of building fabric. Proposed actions are judged in the context of actions taken in the past. Further, today's proposals are judged for their potential impact on the ability of future generations to establish their own

connection with the legacy of past. The built environment is direct and primary evidence of past culture and, as such, is irreplaceable.

This book, *Stewardship of the Built Environment*, makes an important contribution to the literature about the intersection of historic preservation and sustainability. The stewardship of the built environment is simultaneously an act of preservation and sustainability. Stewardship is the core. Young explores the warp and woof of the rich tapestry of sustainable stewardship, illustrating both its vertical and its horizontal relationships.

By conserving what we have, today's investment of material and energy resources can produce meaningful economic benefit while helping to avert negative environmental consequences. Both elements are imperative. By appreciating the legacy of previous generations, we are challenged to understand the significance and value of our own actions in anticipation of generations and centuries to come.

Carl Elefante, FAIA

Preface

The road to the future leads through the past. Although many people in contemporary society perceive the goals of sustainability and historic preservation to be completely contrary to one another, quite the opposite is true. The past can teach many things that will help society get to a more sustainable future. Your choice to investigate this aspect of sustainable design already demonstrates that you have an innate curiosity beyond the prevalent perception that only new buildings can be sustainable. There are many myths and misperceptions about historic preservation and the reuse and rehabilitation of the built environment. This book guides you through the diverse aspects of reusing the built environment to uncover the underlying sustainability contributions and the often overlooked opportunities that building reuse and rehabilitation provides.

I am particularly excited to have this opportunity to expand the contemporary view of preservation and reuse as a sustainability strategy and am hopeful that a greater appreciation for the stewardship of the built environment will ensue. In teaching my classes, I often begin with a discussion of the use of the built environment as a personal living learning laboratory. Marcel Proust stated that “the voyage of discovery is not in seeking new landscapes but in having new eyes.” This is a personal touchstone for how I have learned a great deal about sustainability and the built environment simply by observing how buildings work and the emotional and physical experiences they create. This skill has taken me far beyond a single book, classroom, or the Internet, to where I have learned how to read the built environment and understand the underlying principles and motivations for its construction, the builder’s craft, the owner’s intentions, and its societal importance of place.

This book provides an overview of the stewardship of the built environment (SBE) approach to sustainability and describes how preserving, rehabilitating, and reusing older and historic buildings contributes to sustainable design and respects the past, present, and future users of the built environment. Therefore, the talking points in any discussion about the SBE approach to sustainability embrace the following facts:

- Newly constructed office buildings or houses do not save energy immediately.
- Tearing down existing buildings and replacing them with new buildings that expand overall impacts on the ecosystem is a nonsustainable practice.
- The greenest building is one that is already built.
- Green sprawl poses an unseen threat to sustainability.

This book explores sustainable design through the use of the metaphor of three pillars to illustrate how sustainability is achieved. In this approach, the three pillars consist of social (S), economic (E), and environmental (E) factors that provide the common underpinnings for both historic preservation and sustainable design. It is commonly understood that each aspect of the SEE model must be equally considered or the process will become unstable and ultimately not fully achieve sustainability goals.

This book defines or illustrates the metrics that commonly are applied to sustainable design but with an eye toward the reuse of buildings both individually and in commercial and residential districts. In particular, the reader will learn how to read the built environment and pick out the precedents that led to the tenets of contemporary practices such as transit-oriented design, new urbanism, and smart growth. For individual buildings this will include an examination of how reusing an individual building can contribute to sustainability goals.

This book will give you a deeper insight into the retention and reuse of existing buildings and how you can use SBE to craft a more sustainable environment. After reading this book, you will be able to

- Use the essential terminology and metrics to identify the sustainable and historic aspects of existing buildings
- Interpret the social, environmental, and economic factors that contribute to the sustainability of preserving and reusing buildings (historically significant or otherwise)
- Recognize the sustainable aspects of buildings, neighborhoods, and commercial districts
- Differentiate between the regulatory processes that govern historic and older buildings

- Recognize the smart growth opportunities afforded through the preservation, reuse, and rehabilitation of buildings
- Identify sources for incentives that are available to promote preserving and reusing historic and older buildings

In the contemporary mindset that looks at new ways to construct the built environment (i.e., build society's way out of nonsustainable practices), often overlooked is the fact that preserving and reusing buildings can be a significant strategy in advancing sustainable growth goals. Growing evidence from successful projects fully demonstrates how preservation and reuse of existing buildings can be simultaneously socially, environmentally, and economically beneficial.

The book explores the overlooked opportunities for sustainability that reusing buildings can provide. You will gain a basic overview of the contexts that surround the reuse of buildings that have been designated as historically significant and those that are simply old. Although each designation is accompanied by a social status (or stigma), the opportunity for reuse is often dismissed early in the design development process due to a lack of awareness of what the positive sustainability attributes are or can become. The major focus areas for this book are as follows:

- *Energy use:* Not every old building is historic, much in the same manner that not every new building is more sustainable than all older buildings. A study by the Department of Energy revealed that the energy utilization index (EUI) for commercial buildings built before 1920 is lower than that of buildings built through the end of the twentieth century, and only the most recent buildings being built have comparable EUIs. Much of the public perception about existing buildings is based on the energy hogs that were built after World War II. Conversely, in the residential sector much can be done to improve energy performance and sustainability without tearing the building down. This is particularly true when we consider the energy consumed in demolishing a building and replacing it with a new building.
- *Energy recovery:* When a new "sustainable" house is built, it may take as long as 15 years to recover the new energy used to create the building materials, transport them to the job site, and fabricate the building. Tearing

down an existing residence and replacing it with a similar building will nearly double that recovery period because of the demolition and transport energy needed to remove the existing building and the embodied energy of the building itself. Similarly, a new office building may take as long as 40 years to recover the new energy used to construct it, and that period increases to 65 years when an existing building is demolished to make way for the new building.

- *Sustainable features*: Many buildings built before World War II already incorporate many of the “sustainable” features for which “innovative” buildings being designed and constructed today are winning awards. Among these, much study has been given recently to daylighting, thermal mass, and passive ventilation.
- *Resource recovery*: One of the examples illustrates that tearing down and replacing a residential building generates a material flow more than seven times greater than simply rehabilitating it. While the shift to a material reuse and recycle mode continues to gain favor, demolition still accounts for a significant proportion of landfill capacity. Similarly, the construction of completely new buildings accelerates the rate of extraction and depletion of raw materials used to make new building materials.
- *Historic guidelines*: The process for, advantages of, and constraints caused by the designation of historic status to buildings will be illustrated to dispel some of the more common misperceptions. Examples will illustrate that it is possible to qualify for historic preservation tax credits and earn Platinum, Gold, or Silver Leadership in Energy and Environmental Design certification.
- *Social and regulatory context*: Preservation and reuse occurs in areas of the built environment where people already live and work. Earlier successful efforts for preservation and reuse have been intermixed with a number of controversial issues such as the impact of urban renewal and interstate highway construction on local neighborhoods and business districts and their inhabitants. The oversight and regulatory environment can be daunting to those unfamiliar with the processes that have evolved. Issues of gentrification and displacement of residents have raised concerns about affordable housing. Trends in land use planning and development replicate features and amenities originally found in inner-city and first-tier suburban neighborhoods yet substantially occur at the suburban periphery.

- *Economic incentives*: In the contemporary economic climate, numerous incentives are available to increase the financial feasibility of preservation and reuse. Along with the Federal Historic Tax Credit program, two other major tax credit programs, New Market Tax Credits and Low Income Housing Tax Credits, are used to achieve significant relief from expenses associated with preserving and reusing buildings. Additionally, a variety of state programs and grant programs are used to assist in planning, designing, or constructing preservation and reuse projects.

The book is divided into five chapters that will help the reader understand what stewardship of the built environment can achieve.

Chapter 1: This chapter explores land use practices that have shaped the contemporary built environment and describes the role that preservation has played in society and the environmental movement. Because the reader may not have a preservation background, this chapter (and the remaining chapters) is geared toward raising awareness of the policies, procedures, and accepted practices common to the preservation and reuse projects that have been completed around the United States. This chapter also provides comparative insights into how preservation, sustainability, and land use are treated in other parts of the world.

Chapter 2: Building on the foundation of chapter 1, this chapter illustrates the social context, perceptions, and tools and processes that govern the preservation and adaptive use of buildings. Although the chapter focuses on the preservation and reuse of historic buildings, the insights given provide opportunities for emulating the preservation principles when working with non-historically significant buildings. Because of the broad nature of preservation practice, the points noted here are overviews to provide a general sense of the specific content.

Chapter 3: The environmental factors discussed here provide insights into how reusing buildings can be a sustainable practice. Moving beyond energy efficiency, the reader will see how such factors as embodied energy, energy utilization indices, and material flows can play an important role in the decision-making process. The reader will also learn what architectural form factors of older buildings contribute to their low-technology approach to increasing comfort.

Chapter 4: Economics drives every project. If a proposed project is viewed as economically feasible, then, if resources are available, it will get completed.

However, in the typically risk-averse domain of building construction, lenders, designers, contractors, public officials, and property owners need strong assurance that an unfamiliar process of adaptive use or preservation of an existing building is economically feasible.

Chapter 5: This chapter concludes the book with iconic case studies that exemplify the success of preservation and reuse nationwide, followed by a brief exploration of lessons learned and future implications and directions for stewardship of the built environment.

Appendix A provides a list of acronyms used in the book.

Appendix B provides suggested references for further reading, including relevant websites and a list of supplemental printed works that broaden the reach of the book.

In the digital version of this book, the reader can also click on the embedded hyperlinks throughout the book.

Acknowledgments

I thank the multitude of colleagues, friends, and family who have supported and encouraged my continued development of *Stewardship of the Built Environment*. In crafting this philosophy, I have listened to presentations by, read the writings of, and had discussions with a number of the leading preservation and reuse advocates that have greatly influenced my preparation for this book and my professional activities throughout my career. Among these advocates are Donovan Rypkema, Roberta Brandes Gratz, Stewart Brand, and Richard Moe, whose insights drive my continued engagement on this issue.

This work grew out of the closing chapter of my first book, *Historic Preservation Technology*, which discussed sustainable preservation and made me first see the need for a separate book on this topic. The catalyst for *Stewardship of the Built Environment* arose from an invitation by Robert Harden and David Woodcock of Texas A&M University to participate in a panel discussion at their 2009 Center for Heritage Conservation “Building on Green” Symposium. Preparing for that discussion led to the rudimentary presentation that has since coalesced into this book. While there, I was fortunate to engage Donovan Rypkema, Carl Elefante, Elaine Gallagher Adams, Ron Staley, and Gene Hopkins in a discussion that helped me clarify my perspective on how preserving and reusing buildings is sustainable.

A subsequent invitation by Jeffrey Chusid to speak at Cornell University’s Preservation Short Course 2 further clarified my view of the potentially broader impact of this work. As I sorted out how to make it a viable publication, at the suggestion of Ryan Smith at the University of Utah I submitted it as an online course for a certificate program on sustainability at the University of Tennessee. I was further encouraged by Mark Dekay of the University of Tennessee to use it as the foundation for a book manuscript. After I developed the online course, Arthur C. Nelson, director of the University of Utah Metropolitan Research Center, urged me to submit it to Island Press, which has published it as you see here. I express my appreciation to Island Press for taking this on and particularly for the support I have received from Heather Boyer, Courtney

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Robert A. Young
Salt Lake City, Utah