# Developing Sustainability Guidelines for Historic Districts

By Noré V. Winter

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**The National Trust for Historic Preservation** (www.PreservationNation.org) is a non-profit membership organization bringing people together to protect, enhance and enjoy the places that matter to them. By saving the places where great moments from history—and the important moments of everyday life—took place, the National Trust for Historic Preservation helps revitalize neighborhoods and communities, spark economic development and promote environmental sustainability. With headquarters in Washington, DC, eight regional and field offices, 29 historic sites, and partner organizations in 50 states, territories, and the District of Columbia, the National Trust for Historic Preservation provides leadership, education, advocacy and resources to a national network of people, organizations and local communities committed to saving places, connecting us to our history and collectively shaping the future of America's stories.

**ON THE COVER:** Galveston Historical Foundation's "Green Revival House," exhibits many design features of historic buildings that are today considered "green," as well as new energy-saving features such as the solar collectors on the porch roof and the barrel for collecting rain water. The Foundation recently rehabilitated this 1891 cottage which was severely damaged by Hurricane Ike in 2008. As more and more owners of historic building are considering energy-saving adaptations such as the ones found on the Galveston rehab, historic preservation commissions are rethinking their preservation guidelines to incorporate sustainability concerns. Photo by Brian Davis, Galveston Historical Foundation.

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## INTRODUCTION

Let's say you are a member of a local preservation commission and have an application before you that would alter a Craftsman bungalow in your local historic district. The proposal calls for removing original windows and replacing them with new high-performance ones promising energy savings, as well as installing solar collectors on the roof.

Furthermore, your city recently adopted a new sustainability ordinance requiring that renovation projects achieve additional energy savings. The homeowner maintains that these alterations should be permitted in order to comply. How should the commission respond? And how will the design review guidelines support its decision?

More and more commissions regularly face these kinds of questions. In many cases, their design review guidelines lack clear direction about how to balance green building objectives with the charge of protecting cultural resources. The basic principles of most guidelines certainly call for preserving original materials and other character-defining features as well as respecting the inherent energy-saving properties of historic resources, but they usually address sustainability indirectly, in terms of how "Building Green" is seen today.

In most cases, commissioners will try to support reasonable energy-saving proposals, but they may be uncomfortable helping owners balance energy and preservation concerns. Does energy conservation "trump" preservation, or are the two mutually achievable? Today, clearer guidance is needed, both for commissioners and for property owners, to address these issues.

This challenge is growing. Working to achieve more sustainable places is the most talked about topic in city planning today. Special committees are operating in numerous cities and towns across the

### PRESERVATION COMMISSIONS' ROLE IN PROMOTING SUSTAINABILITY

Perhaps more now than at any other time since their formation, historic preservation commissions have a vital—even essential—role to play in their communities. Fully 43 percent of carbon emissions in the United States come from the operation of our existing buildings—and older homes, those constructed before 1940 especially, tend to use more energy than those of more recent vintage. (Interestingly the exact opposite tends to be true of commercial buildings—these buildings tend to use *less* energy per square foot than their more modern counterparts.) We simply won't be able to reach aggressive carbon reduction targets needed to stave off the worst of global warming impacts without addressing the performance of our existing building stock—and older and historic buildings *must* play their part. Historic preservation commissions have a crucial role to play in helping members of their community achieve these goals.

Too often, historic preservation is viewed as an obstacle to achieving efficiency or other environmental improvements in older buildings. Sometimes this perception is ill-deserved, perhaps based on misunderstanding of or miscommunication about the ways in which preservation and green building can be mutually reinforcing goals; but sometimes this negative view of preservation has resulted from inflexibility in the application of preservation standards. Preservation commissions are challenged in this new era to address two values: that of preservation, and that of conserving our natural resources. Often these goals will be mutually supporting, but sometimes they will not and difficult decisions will need to be made.

This handbook is designed to help historic preservation commissions navigate this new, important terrain. While it doesn't offer all the answers, we hope it offers a good framework for rethinking your preservation guidelines in light of sustainability concerns. We look forward to hearing your feedback and continuing to work with you on this important issue.

*—Emily Wadhams, Vice President, Public Policy*
*National Trust for Historic Preservation*

country to help craft policies and regulations related to sustainability.

Several cities and states have already adopted regulations and incentive programs that focus on the environmental aspects of sustainability. Portland, Ore., adopted a "green bundle" of development code amendments that promote the installation of solar panels, water cisterns, wind turbines, and eco-roofs. The focus is on removing regulatory "obstacles" to these actions by exempting certain work from review, or by providing "by-right" approvals when specific design standards are met. For example, installing solar panels is exempt from the design review process for properties within historic districts when the installation meets certain specified design standards, such as placing the panels flat with the roof, and setting them back a specified distance from the front of the building. (This exemption applies only to "contributors" in historic districts, not to individually designated landmarks.)

Historic resources, and older properties in general, should play key roles in these local sustainability programs. The connection between historic buildings and sustainability is especially relevant when a commission reviews an energy retrofit proposal for a certificate of appropriateness under its preservation ordinance.

Ideally, sustainability policies for preservation are first set forth in the community's preservation plan, which often will be a component of a comprehensive plan. But where such policies are not in place, it is important to address them in the design guidelines.

### Scope of this Booklet

This booklet describes how local historic preservation commissions may incorporate sustainability concerns into their design guidelines, including the basic green building topics that most frequently arise as well as some of the broader aspects of the field. Written with local preservation commissions in mind, it provides an overview of the different approaches that communities may use to introduce sustainability concerns into their design review process.

It focuses on design guidelines for the rehabilitation of historic buildings, but also touches on site design and new construction in historic districts. It does not provide detailed guidelines for specific design topics, because these may vary depending upon other policies and regulations in an individual community. Instead it describes an approach to writing and organizing the guidelines, and for setting an overall constructive tone for their use.

Also note that it does not attempt to provide guidance on sustainability issues outside of historic districts, and it is not a primer for the design of new energy-efficient buildings. Many excellent publications exist that address those topics.

### Why Are Preservation Commissions Addressing Sustainability?

For the past 20 years or more, local design guideline documents touched lightly on specific discussions of sustainability, even though the underlying principles of retaining original materials and

### THE NATIONAL TRUST FOR HISTORIC PRESERVATION'S SUSTAINABILITY PROGRAM

The construction, operation, and demolition of buildings accounts for well over 40 percent of the United States' carbon emissions. Reusing and retrofitting older and historic buildings is essential to helping reduce the impact of buildings on the environment. In fact, older and historic buildings are one of the United States' greatest renewable resources.

Through its Sustainability Program, the National Trust for Historic Preservation is focusing the nation's attention on the importance of reusing and retrofitting existing buildings and reinvesting in older and historic communities—and doing so with respect for the character that makes these places unique.

The National Trust's sustainability work is focused on finding federal, state, and local policy solutions that level the playing field for older buildings and enable people to save and improve the energy performance of the places they care about. In addition to ongoing federal advocacy work on Capitol Hill, the National Trust is also working through the Seattle-based Preservation Green Lab with national partners to pioneer new policy solutions—from energy codes to neighborhood approaches to energy efficiency—that will ensure older and historic buildings can remain vibrant and vital parts of sustainable communities across the country.

The National Trust's sustainability website, preservationnation.org/issues/sustainability, offers a wealth of information that is useful to historic preservation commissions on everything from retrofitting your wood windows to the latest news and updates from the Preservation Green Lab and Capitol Hill.

Many owners and stewards of government, commercial, and industrial buildings are undertaking energy-saving upgrades and retrofits, such as the installation of solar panels on the state capitol in Denver.

Photo by Jennifer Buddenborg.

key features are, of course, fundamental concepts for sustainability as well.

Perhaps the initial impetus for preservation commissions to address the topic more directly arose when increasing numbers of homeowners began seeking to replace original windows with ones advertised to be more energy efficient. Stories abound of homeowners ripping out their single-pane windows to replace them with double-glazing. Soon owners and stewards of other building types—including major educational institutions, government buildings, and commercial and industrial structures—were requesting permission not only to install replacement windows but also to undertake a vast array of other energy-saving upgrades and retrofits.

While many owners of historic properties continue to pursue energy-saving improvements on their own initiative, others must comply with new state and local regulations that mandate energy-efficiency targets for rehabilitations. Many communities are also writing sustainability policies that look beyond energy conservation to address resource conservation, recycling of building materials, and broader energy and conservation issues. In Boulder, Colo., for example, the city council adopted a *GreenPoints* program in 2009, requiring remodeling projects and additions to meet a minimum threshold of energy efficiency as determined in a scoring system. Another Boulder ordinance requires that most construction debris be re-directed away from landfill, through recycling or other means of reuse. Both of these ordinances affect preservation activities.

These actions raise questions of how new sustainability requirements can be accommodated while preserving our historic resources. There are, of course, ways to meet both preservation and sustainability objectives together, but the need to reduce energy usage and other environmental impacts associated with our buildings requires commissions to re-think how preservation interests are balanced with environmental concerns.

## What Do We Mean by "Sustainability?"

Sustainability programs are widely recognized as having three components: (1) cultural/social, (2) economic, and (3) environmental. Historic preservation contributes to all of these, and to some extent all three may be addressed in design review guidelines. This is because sustainability is a more global value underlying historic preservation, although it may not be so clearly articulated in some preservation ordinances and design guidelines.

### Cultural/Social Component of Sustainability

Most people understand that preserving historic neighborhoods and commercial districts helps maintain a connection to our country's heritage. This has been a fundamental part of the preservation movement since its beginning.

Preserving existing neighborhoods also helps retain the social fabric of a place. Older neighborhoods, both residential and commercial, are often relatively compact, and so promote walking. Residents have access to public transportation systems, thereby reducing vehicle miles traveled by car. While this could be considered a part of the environmental component of sustainability, it also crosses over into social considerations, because these places help support a sense of community. Compact older neighborhoods also support healthy living initiatives now sponsored by public health agencies, in which walking more is a means toward achieving a healthier society.

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Many historic neighborhoods also are pedestrian friendly, and encourage interaction among residents. This supports a system of "eyes on the street" that also is a part of cultural/social sustainability.

Commissions frequently cite these social benefits of historic preservation in introductory sections of their design guidelines documents. In updating their guidelines, commissions should frame those discussions as being part of the three-legged stool of sustainability.

**KEEPING OLDER neighborhoods occupied, and even in some cases increasing their density while preserving character, means that pressure is reduced to expand our cities farther out into the next corn field.**

### Economic Component of Sustainability

The economic benefits of local historic districts are, of course, well documented. These include higher property values, job creation in rehabilitation industries, and increased heritage tourism. Examples also show ways in which the quality of life is enhanced for those living or working in historic areas, and how these benefits in turn help to recruit desirable businesses for the community at large. The Old Town Historic District in Fort Collins, Colo., for example, appears in marketing materials produced by the city in a re-branding effort to attract businesses and visitors to the city.

Commissions often include summaries of these economic benefits in design guidelines as well. Again, when updating or revising design guidelines, this information should be explained in the light of sustainability.

The National Trust provides an excellent summary of the economic benefits of preservation on its website (www.PreservationNation.org), including a wide range of studies conducted by individual states documenting the impacts of local historic district designations. These studies demonstrate that the rehabilitation industry generates local jobs and that historic commercial districts create distinctive business addresses and support heritage tourism. Special benefits, such as the various tax credit programs offered at federal, state, and local levels, also encourage property owners to rehabilitate their buildings, often contributing to individuals' economic well-being.

### Environmental Component of Sustainability

The environmental component of sustainability tends to be the main focus when commissions discuss developing guidelines related to green building, because the proposals they see frequently include actions in this category. Applications to install new windows and attach solar collectors are perhaps the most common.

Among other things, this component focuses on saving energy, and also generating it, through "clean" methods, as well as minimizing demand for water and conserving building materials.

Information related to these three components of sustainability will appear throughout a guidelines document in various forms. In some cases, they will be part of rather broad concepts that may be included in an introduction to the guidelines themselves. In other cases, they will be embedded in specific design guidelines statements.

## Charting a Strategy for the Design Guidelines

When starting a project to write guidelines for sustainability, a commission needs to chart out a comprehensive strategy. It may be tempting to jump in and adopt a policy about window replacement or solar collectors by itself, but this approach risks becoming a single-issue response without an overview of how these individual guidelines fit into a more comprehensive strategy. Instead, a commission should start by defining clear goals for sustainability as they relate to historic resources. This will help to determine the extent of the detail that should be provided. It is then best to outline how the specific topics will be organized, and finally determine the format in which the material will be published. Some suggestions for charting this strategy appear in the sections of this booklet that follow.

## STARTING CONCEPTS—INTRODUCING SUSTAINABILITY IN PRESERVATION GUIDELINES

Before getting into details of guidelines, a set of general sustainability concepts should appear as background to the design guidelines. Providing this information also helps establish the rationale for preservation as a sustainability initiative. A commission therefore should decide how to introduce some of the broader concepts that will underpin the more specific design review criteria that will follow. Some general categories for introductory materials that may be considered are resource conservation, energy conservation, and energy generation.

### Resource Conservation

A discussion of conserving resources focuses on making the best use of existing buildings and lands. This includes avoiding negative impacts from new construction, making smart use of land, and optimizing the life cycle of building materials.

### Avoiding Negative Environmental Impacts from New Construction

The construction of new buildings requires the use of a tremendous amount of fossil fuels and other natural resources, which releases greenhouse gases into the atmosphere and causes other negative effects. When we re-use buildings, we avoid the negative environmental impacts associated with new construction.

For example, a study published in 2007 in the UK finds that it takes between 35 to 50 years for a new, energy-efficient home to recover the carbon expended during the construction process, suggesting that in many instances it's far better to keep our existing buildings and make them more energy efficient. (Source: Empty Homes Agency, *New Tricks with Old Bricks*).

### Making Smart Use of Land

Keeping older neighborhoods occupied, and even in some cases increasing their density while preserving character, means that pressure is reduced to expand our cities farther out into the next corn field. This supports policies for compatible new construction in historic districts.

*Appropriate Density*

Promoting infill in historic districts keeps close-in neighborhoods viable and makes use of land already served with infrastructure. Planning policies and zoning regulations in many cities today also encourage increasing density in developed areas in the interest of making mass transit more efficient and in reducing vehicle miles traveled.

Cities are once again allowing, and even encouraging, residential carriage houses and other forms of attached and detached accessory dwelling units in established neighborhoods. In downtowns, the emphasis on increasing density and facilitating mixed-use projects presents opportunities for adaptive use of older and historic buildings. For these reasons, guidelines that indicate a preservation commission's willingness to consider compatible infill in its historic districts will be important. These are all aspects of land-use policy that may be explained in an introduction to the guidelines.

Note that "density" describes the number of dwelling units, or the number of people occupying a unit of land, not the bulk or size of structures. This distinction is important to make, because new, large McMansions are, of course, detrimental to historic neighborhoods.

*Affordable Housing*

The need to create more units of affordable housing in our cities is another smart land-use policy frequently discussed. The construction of secondary units on existing lots, often permitted in older and established neighborhoods, can moderately increase density while preserving the character of a neighborhood. Because these units tend to be smaller than the primary houses, they help provide more diversity in house prices, which is often a goal of affordability programs. This technique of permitting secondary units should be considered for many historic districts.

*Landfill Reduction*

Preserving and rehabilitating a building reduces the amount of discarded building material that ends up in landfills. This is an indirect concept introduced in the design guidelines, but it can also relate to demolition proposals and criteria for demolition, which may appear in the guidelines themselves or in the preservation ordinance. The commission may, for example, require that certain materials and details from demolished buildings be stored for use elsewhere.

In previous decades, preservationists shied away from this idea, for fear that it signaled an acceptance of demolition as an option. Requiring a banking of building materials, however, is consistent with emerging regulations in local jurisdictions that require re-purposing of salvage materials and reducing demand for landfill space.

### Life Cycle Analysis

Considering the life cycle of building materials—including the energy consumed to create them, but also the environmental costs, such as resource depletion and pollution—is an idea that may be difficult to convey, but it is important to at least set out this concept as a foundation for the guidelines. Comparing these "costs" to the longevity of the material is a key to life cycle analysis. Often more traditional materials will score the highest, because they will last longer and have less pollution associated with their manufacture, in contrast to some newer materials that may appear cost-effective early on, but are not as durable over time. Some new synthetic materials used in windows are often cited as examples of this.

Typically a commission will not directly evaluate the life cycle performance of materials that are proposed for alterations, but the technical information related to this topic may be put forth to property owners to help them develop a strategy for sustainability. It also will underpin reasoning to retain older, significant materials that do have longer life cycles than some replacements would.

**Increasingly, commissions are reviewing requests to install solar collectors on historic buildings. Pictured here are solar panels on the Findlay Market in Cincinnati, Ohio.**

Photo courtesy of the Cincinnati Preservation Association.

**Property owners should be encouraged to conduct an energy audit to gain a better understanding of how energy is currently used and to uncover any "quick fixes" that will help save energy. Here a fan draws air through the house to help pinpoint openings where air can leak into the building.**

Photo by Elizabeth Byrd Wood.

## Energy Conservation

Reducing energy consumption for a property is, of course, a key objective for many property owners, and should be addressed in several specific design guidelines. But the topic also should be introduced in the context of developing an overall strategy for the property. At this level, the discussion should raise awareness that conservation includes finding ways to maintain comfortable conditions, including light and temperature, to facilitate use of the property. Using built-in energy-saving features and combining these with new technologies will also be a part of these comments.

## Energy Generation

The companion piece to energy conservation is energy generation, which helps reduce demand on public utilities and minimizes operating costs. Examples of energy generation methods include solar panels and wind turbines. Since property owners may immediately jump to these two approaches, such options should be placed in context with the other parts of sustainability in the introductory materials.

## Developing an Energy Strategy for the Owner

Another option for the introduction to sustainability guidelines is to outline an overall strategy for energy conservation and generation for the property owner. This should include an energy audit, an evaluation of existing systems, and the setting of goals for achieving savings. Several good publications exist that describe how to prepare a strategy for older homes in general, and some specifically address historic buildings.

For a commission's preservation guidelines, introducing the concept of an energy strategy could appear as a preface to specific guidelines related to sustainability. While it should help an owner chart a more effective path for energy efficiency, an energy strategy also will help the commission in reviewing a proposal for alterations, in that the work can be placed into context with overall energy-saving objectives. The point is that some small steps may be more effective in saving energy, and that these are only put into perspective when they are evaluated as part of a comprehensive strategy.

Some state preservation offices are also promoting this as a first step in reviewing projects that they see. The California Office of Historic Preservation, for example, in a working paper, *Review of Green Preservation Projects: An Approach*, urges applicants who are seeking tax credits for rehabilitation projects involving energy-conservation measures to first submit a statement that defines the sustainability goal for the project and outlines the strategy for achieving it.

The intent is to plan specific projects in a broader context to assure maximum benefit. Sometimes the payback is better for an alternative approach that otherwise might not have been considered if goals were not specifically stated. For these reasons, commissions should ask about the overall energy-saving strategy that owners have when reviewing improvement proposals related to energy conservation.

Here are some basic steps to suggest to property owners in preparing a strategy:

**1. Conduct an energy audit.**

Energy audits are essential to understanding how energy is used in a building, and how performance can be improved in the most cost-effective way. Conducting an energy audit and setting performance goals in terms of anticipated energy savings encourage a building owner to take a more comprehensive view of how energy is currently used, and perhaps lost, in the daily and seasonal cycles of use. An audit often reveals a number of opportunities—some of which might be "quick fixes" that will save energy.

**2. Set goals for sustainability as a part of the project.**

This broad view will help to place individual actions for energy conservation into context, and may, for example, demonstrate that increasing insulation in walls, ceilings, and foundations should take priority over replacing windows.

**3. Identify management strategies to improve energy efficiency.**

A key part of operating building efficiently is hands-on participation by building occupants in managing air temperature and ventilation. Management strategies for energy conservation (such as raising and lowering awnings to adjust temperatures, or using a ceiling fan to de-stratify air) also may be introduced in a section of the guidelines that covers developing an energy plan.

These procedures may not be a direct part of the design review process, but raising these concepts, at least briefly, is important because an energy-saving proposal should be considered in the context of how the building can be managed more efficiently. In some cases, a proposal may in fact include work that would facilitate better energy conservation management, such as installing awnings where none exist, or planting a new row of trees as a windbreak.

**4. Develop the components of the strategy.**

When the owner can present this energy strategy as a part of his or her application for a certificate of appropriateness, it also can help the commission consider the

potential benefits of the actions proposed. If the strategy contains energy audit findings, this information may help place a specific request, such as window replacement, into context in terms of payback of investment. This may help the commission feel more comfortable about its findings in the review stage. While some commissions would argue that they should not consider energy performance in making the determination of appropriateness, addressing energy concerns is essential to preservation being an active part of a community's sustainability program.

## ENERGY-EFFICIENCY STRATEGY

Follow these basic steps when considering alterations for energy efficiency.

**Step 1.** First, maintain building components in sound condition.

**Step 2.** Then, maximize inherent sustainable qualities.

**Step 3.** Next, design landscapes to conserve resources.

**Step 4.** Finally, add new technologies sensitively.

Introductory materials drafted for new preservation guidelines for the town of Sausalito, Calif., included four basic steps, listed above, to developing an energy-efficiency strategy for historic resources.

## WAYS TO ORGANIZE THE GUIDELINES

How should the guidelines be organized? While it is important to think of sustainability in the three components presented in the preceding discussion, the actual way in which the guidelines are organized is more likely to follow the typical outline found in many conventional preservation guidelines. For example, the commission may group the guidelines into different sections related to the type of construction involved. A section related to rehabilitation will be a primary one, with another for additions, and another for landscapes. A section on new construction may also be needed.

Guidelines can illustrate how operable systems, such as double-hung windows, can be used to help manage interior climatic conditions.

Draft guidelines prepared for the City of Sausalito, Calif., by Winter & Company.

### The Rehabilitation Section

For rehabilitation guidelines, the focus is on employing appropriate energy-conservation and energy-generation techniques.

For example, the guidelines might address ways to manage existing energy-saving systems that are found in many older buildings. This would describe ways to manage levels of temperature, ventilation, and lighting using the inherent energy-saving features that exist in many older building types. Adjusting a double-hung window to permit airflow at the top and bottom is an example, as is using an operable awning in response to varying exterior light conditions. A "relearning" of how to use these systems is a basic early step in improving energy performance in older buildings. This information may be included in local design guidelines but, in many cases, simply providing references to related material may be more effective. For example, an educational video produced by The Georgia Department of Natural Resources, Historic Preservation Division—*Buildings For All Seasons: Energy Conservation in Historic Structures*—highlights energy-saving features that are common to many historic properties. Released in 2001, this video is available on the department's website.

Rehabilitation guidelines also address preservation of original materials, which are often the "greenest" materials because they are durable, can be repaired easily (as opposed to having to be replaced entirely), and frequently are free of substances that may be hazardous. In this case, existing guidelines addressing treatment of historic building materials will suffice, but adding a sentence to them that points out the green-building principles of retaining these materials will underscore the relationship to sustainability. Other rehabilitation guidelines will address energy efficiency for existing windows, and appropriate retrofits to them.

Guidelines might also cover construction materials. They need to address life cycle costs of new building materials that may be considered "green." Sometimes the apparent low, initial cost of a new material or technology may be outweighed by its short life cycle. The relatively short life span of some vinyl windows is an example of this.

This section will also address the best places to locate energy retrofits, such as solar collectors. The emphasis for these will be on preserving the character of the historic resource while placing energy generating equipment where it will be most effective.

### The Section on Additions to Historic Structures

Guidelines for additions typically focus on techniques to minimize visual and physical

impacts on the original structure. Identifying the appropriate location for an addition is a starting point for all guidelines related to this section, with a focus on maintaining the character of the historic resource. In the context of sustainability, it will be important to consider how the addition may be positioned such that it maintains solar access opportunities for other parts of the property, and for neighbors. This also may be a preferred location for some energy retrofit technologies, such as solar collectors.

The materials selected for the addition will also have implications for sustainability. While compatibility with the historic structure is a paramount concern, so is the environmental impact of the addition. Promoting use of materials that have a low impact in terms of their fabrication and life cycle will be important.

### New Buildings Section

For infill or new construction guidelines, the focus is on how a new building may be positioned to maximize environmental benefits for its neighbors. The guidelines typically call for spacing structures apart and controlling building mass in order to maintain access to light and air for adjoining properties. This is particularly relevant as interest grows in re-establishing backyard gardens and making use of outdoor spaces in general for energy-saving activities.

### Landscape Design Section

Many commissions also review alterations to historic landscapes, as well as new site designs within historic districts. In this category, sustainability questions may arise in the form of proposals for installing xeriscapes or drought-tolerant landscapes, shaping the land to retain storm water on site, using porous pavers, and planting shade trees and windbreaks. Renewed interest in backyard gardens is a related topic. Providing adequate light and air for gardens may be appropriate to discuss in the guidelines. Even streetscape designs, which are a part of the public realm, may reflect new trends such as the installation of energy-efficient street lights or water conserving strategies for planting strips.

## IDEAS FOR SPECIFIC GUIDELINES

The preceding discussion focused on the fundamental elements of a sustainability strategy that a commission may use and a basic organizational structure. This section will look at specific design topics and how they might be addressed in the guidelines. They are grouped into three categories: (1) energy conservation, (2) energy generation and (3) landscape design. There are, of course, other methods for organizing these topics and others related to sustainability, but this approach provides an easy way of thinking about different designs based on the underlying objectives they may seek to achieve.

### Energy Conservation Guidelines

A major part of the actual design review guidelines that relate to sustainability will be those addressing energy conservation measures, such as awnings, windows, and building insulation. Here are some examples:

#### Awnings and Canopies

For some time, preservation guidelines have addressed awnings, usually noting that they are appropriate to install where evidence of their previous use exists, or where there is precedence for them on similar buildings in a district. Guidelines also address the shape, the fit to an opening, and materials.

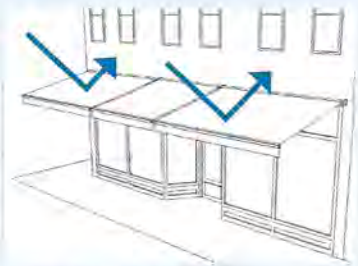
Awnings help moderate temperatures inside buildings, and in commercial areas they shelter sidewalks, which encourages pedestrian activity along streets. This in turn reduces automobile use and promotes energy-saving transportation modes. Design guidelines for downtown San Antonio produced in 2006, for example, promote the use of awnings and canopies based on historic precedent.

Taking into account sustainability, commissions should consider broadening the language to also permit new sun shading devices on primary and secondary elevations, even for styles where they were not used historically, but where they may be interpreted as new, compatible alterations.

These are basic principles for awnings and canopies to consider for the guidelines:

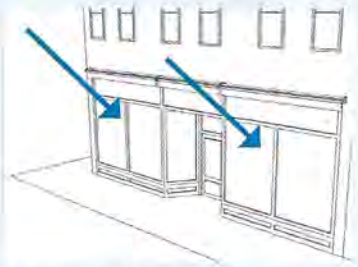
1. Encourage installation of awnings and canopies when compatible with the building period and style.
2. Promote the use of operable awnings that can respond to changing climatic conditions.
3. Install awnings and canopies in ways that minimize damage to historic building fabric and such that they can be removed in the future without negative effects.

### USE OF OPERABLE AWNINGS FOR ENERGY EFFICIENCY



**Awnings Open to Provide Shading**

Awnings can be open in the summer to provide shading for the storefront and the sidewalk.



**Awnings Closed to Allow Solar Access**

Awnings can be left closed in the winter to provide solar heat gain and daylighting.

Draft guidelines prepared for the City of Littleton, Colo., by Winter & Company.

**A new operable awning design adapts older concepts but uses a lightweight metal frame. Operable awnings allow owners to adjust light and solar heat gain into the interior.**

Photo courtesy of Winter & Company.

4. Consider new canopy designs that incorporate photovoltaic systems, while drawing upon traditional forms and materials.

### Windows

The window discussion is, of course, one of the hottest concerns regarding green building and historic properties, and one of the best documented. Even so, many people assume that replacing an older window is good building practice, even though the evidence is to the contrary. For this reason, the guidelines should provide education on this topic as well as provide criteria for appropriateness.

These are basic principles for windows and energy conservation to consider for the guidelines:

1. Evaluate window performance in the broader context of an energy audit and improvement strategy.

2. Whenever practical, make best use of original windows. Keep them in good repair and seal all leaks.

3. Use operable systems to enhance performance of original windows. This includes storm windows, insulated coverings, curtains, and awnings.

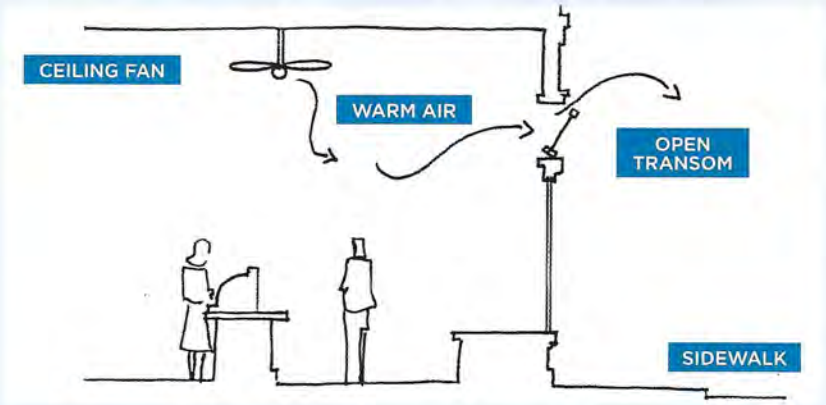
4. For window replacement or alteration, evaluate the significance of the feature and its location, as well as the condition of the original. Removing or altering a window on a secondary wall may be more acceptable, for example, if repair or retrofit is more complicated in that location.

Some local commissions have published their own information materials addressing repair and replacement questions related to windows, and the National Park Service has several useful documents, including some in its *Preservation Briefs* and its *Preservation Tech Notes* series. Many of these provide more technical information than a commission should include in its design guidelines, but they are useful references for developing an understanding of the technical aspects of window repair, the use of storm windows, and replacement options.

#### *The National Park Service and Guidance about Windows*

The National Park Service identified energy conservation as an inherent feature of many historic buildings in one of the first of its *Preservation Briefs*, the ongoing set of publications that focus on specific, often technical, aspects of maintaining the character of historic resources. Published in 1978, Brief #3, *Conserving Energy in Historic Buildings*, provides guidance on methods for improving performance of windows, adding insulation, and reducing air leaks. (This Brief is currently being updated.) Subsequent publications in this series have often touched on energy conservation, such as Brief #13, *The Repair and Thermal Upgrading of Historic Steel Windows*. While these publications lay a good foundation for approaches to energy

**TRANSOMS**




**This sketch was used in the design guidelines for the Main Street program in Booneville, Mo., to illustrate how to make best use of the inherent energy-saving features of a traditional commercial storefront. The Booneville guidelines, developed in 1989, are an early example of introducing sustainability concepts in historic districts.**

Illustration courtesy of Booneville Main Street.

## RESIDENTIAL BUILDING ENERGY-EFFICIENCY DIAGRAM

This diagram summarizes the principal guidelines for energy efficiency and energy collection. These measures will enhance energy efficiency while retaining the integrity of the historic structure.

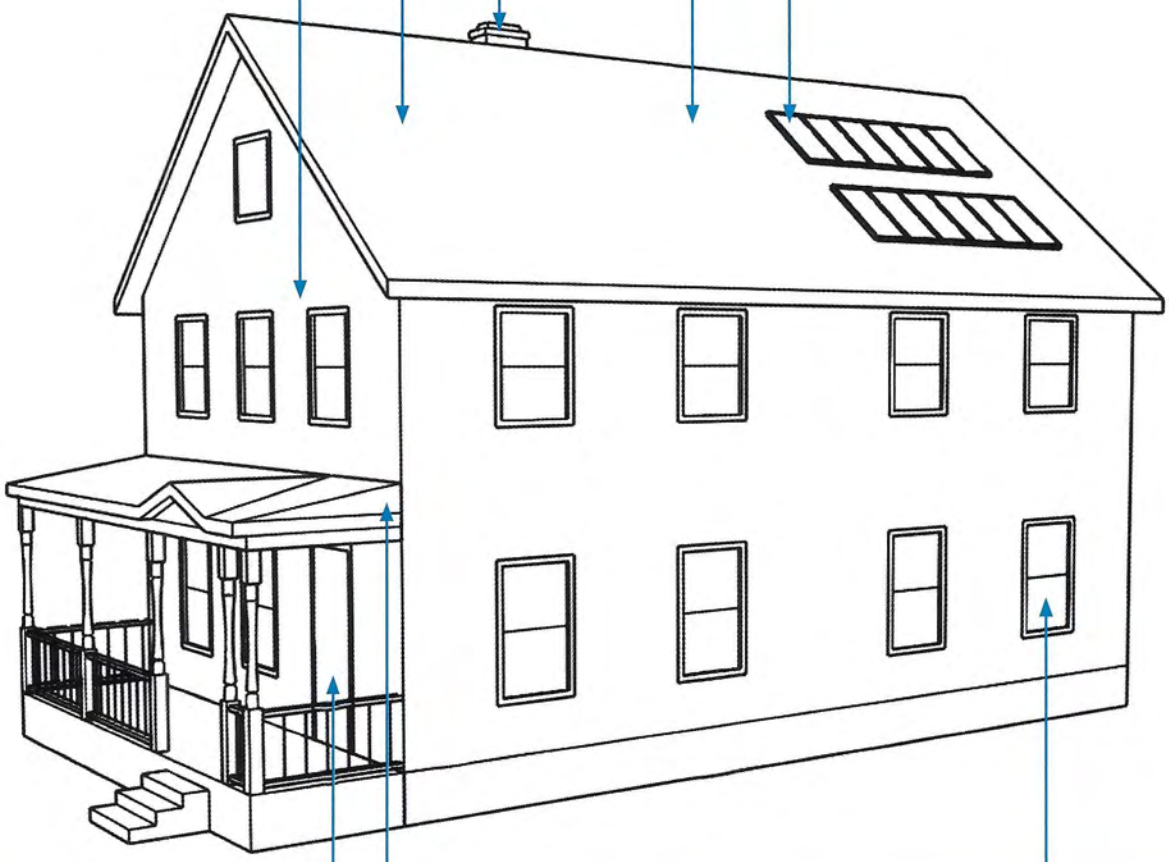
**Chimney**
Install draft stopper

**Attic**
Insulate internally

**Walls**
Insulate internally

**Roof Material**
Retain and repair

**Solar Panels**
Set back from primary facade



**Doors**
- Retain and repair original doors
- Weatherstrip

**Shutters, Awnings, and Porches**
Restore porches and awnings

**Windows**
- Retain and repair original or early windows
- Retain original glass
- Enhance thermal and acoustic efficiency with storm windows (preferably interior)
- Weatherstrip

**This illustration helps homeowners visualize the energy-related actions that are addressed in the guidelines.**

Draft guidelines prepared for the City of Deadwood, S.D., by Winter & Company.

**Solar panels are visible on these roofs in Boulder, Colo., but remain subordinate to the overall building form.**

Photos courtesy of Winter & Company.

conservation, commissions will need to tailor this information to local conditions and reframe it for use in design review.

### Building Insulation

Many insulation retrofits occur from the inside and typically will not be subject to review by the commission, although there have been practices in the past that have affected building exteriors. For example, some owners have had insulation blown into wood frame wall cavities by cutting plugs in the exterior wood siding. They also have installed the insulation in a way that has trapped moisture in the wall, which sometimes appears on the exterior as paint blisters. Other times, chemicals in the insulation may have combined with moisture to form acids that damage historic features.

These are basic principles for building insulation to consider for the guidelines:

1. Use new materials that are environmentally friendly and that will not interact negatively with historic building materials.

2. Install the insulating material in a way that minimizes altering or damaging significant materials and their finishes.

3. Provide sufficient ventilation to avoid moisture build-up in the wall cavity.

## Energy Generating Technologies

Some green-building questions focus on the installation of systems to generate heat or electricity. Solar collectors that transfer heat to domestic water and space heating systems, as well as those that generate electricity, fall into this category. The location, size, and appearance of these systems are factors for a local commission to evaluate. Here are some examples:

### Solar Collectors

Solar collection technologies are changing swiftly, and new designs appear almost daily. Some innovations help to minimize the potential effects on historic buildings. For example, photovoltaic systems can now be embedded in a variety of building materials, including roof tiles, roofing shingles, and even siding. For situations where installing new building material is appropriate, these may be good choices.

Even where more conventional solar panels are to be installed, improvements in design and performance are yielding thinner structures that can often lie parallel with the roof plane and achieve reasonable efficiencies. In some cases, they don't have to be positioned at the "optimum" angle any more.

Connecticut, Maine, New Mexico, and North Carolina currently have legislation that specifically addresses the regulation of solar panels in historic districts. Preservation commissions should be familiar with these regulatory limitations in order to protect themselves from ramifications when reviewing applications for energy-generation systems.

These are basic principles for solar collectors to consider for the guidelines:

1. Minimize visual effects by locating collectors away from primary public view locations. A collector should not obscure significant features or change the perception of the overall character of the property.

2. Minimize structural impacts by attaching a collector in a manner that avoids damage to significant features.

**SOME COMMISSIONS may permit solar panels to be more visible, using the argument that they can be interpreted as "later alterations," when the historic character of the resource can still be understood.**

### Solar Access Legislation

Local historic preservation commissions need to be aware of any solar access or solar rights legislation in their state. There has been a steady increase in legislation geared toward removing regulatory barriers to the installation of energy-generation systems, such as photovoltaic systems. States have either adopted new legislation or strengthened existing laws in an effort to reduce zoning laws that unreasonably restrict solar panel installations.

The collector should not overload structural systems or threaten the integrity of roof protection systems.

3. Install a collector in such a way that it can be removed and the original character of the building can be easily restored. This is especially important because technologies are improving, and new ones may become available that are even more compatible with the building's character, while enhancing performance.

4. Some commissions may permit solar panels to be more visible, using the

argument that they can be interpreted as "later alterations," when the historic character of the resource can still be understood. This may be a factor where local governments encourage high visibility of solar retrofits in order to promote their use.

### Wind Turbines

Proposals to install wind turbines on individual properties are also appearing before commissions. The projects that might come before a commission involve the installation of small individual turbines roughly four feet in diameter (as opposed to larger projects to establish arrays as wind farms).

These are basic principles for wind turbines to consider for the guidelines:

1. Install turbines as free-standing structures in unobtrusive locations, when feasible.

2. Minimize visual effects of wind turbines from primary public view locations. Turbines should not obscure significant features or change the perception of the overall character of the property.

3. When adding to a historic building, minimize structural impacts by attaching turbines in a manner that avoids damage to significant features. The turbines should not overload structural systems or threaten the integrity of roof protection systems.

4. Install turbines in such a way that they can be removed and original character easily restored.

### Passive Energy Collection Systems

Passive systems typically include designs to capture and retain heat from the sun to minimize temperature swings in a building. For historic buildings, these are difficult to add to the original structure without significantly changing the character of an exterior wall, but they may work successfully in an addition.

The degree of "transparency" that this type of system may have can be an issue. A Trombe wall, for example, uses a large glass surface placed in front of a masonry wall, which can be out of character with a historic building. However, if it is installed on a later addition, and placed in a position that is less visible, it may be appropriate.

These are basic principles for passive collection systems to consider for the guidelines:

1. Minimize visual effects of passive collection systems from primary public view locations. Consider the visual impacts on traditional ratios of windows to solid walls that are seen in the historic district.

2. Install passive systems in unobtrusive locations. Locating them on a new wing or addition is preferred.

3. When installing a passive system on a historic building, minimize structural impacts and avoid damage to significant features.

4. Use materials that appear similar to those seen traditionally in the area.

## SITE ENERGY-EFFICIENCY DIAGRAM

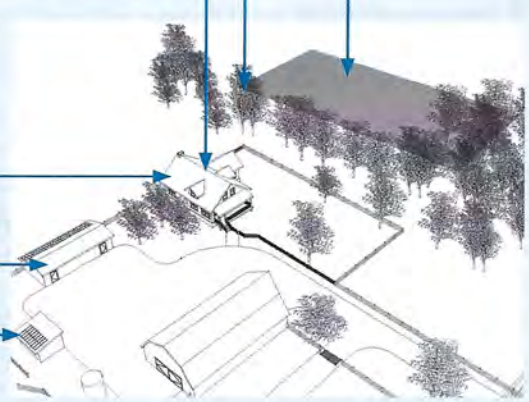
**Trees**
- Retain mature
- Plant new
- Provide shade
- Serve as windbreak

**Orientation**
Building historically aligned for efficient sun and wind exposure

**Historic Structure**

**New Construction**

**Historic Structure**



**Wind Power**
- Place away from house
- Screen with landscaping from public view

**Solar Panel Location Hierarchy**
1. Detached, on site
2. New construction
3. Accessory structures (historic)
4. Main structure (historic)

This type of drawing provides a visual summary of guidelines concerning site design that relate to sustainability.

Draft guidelines prepared for Pitkin County, Colo., by Winter & Company.

**Water collection devices, such as rain barrels, should be placed in unobtrusive locations to minimize visual impacts on historic resources.**

Photo by Jo Leimenstoll.

## Landscapes and Site Design

### Plant Materials

On sites where space allows, owners may seek to install trees or shrubbery to serve as windbreaks, and to provide seasonal shading as energy-saving and conservation measures. In other cases, owners will propose new drought-tolerant plants to reduce the need for irrigation. Guidelines for this should identify areas where such designs would be appropriate. Installing a windbreak along the side of a house, for example, will be less obtrusive than in the front.

In most cases, the guidelines for sustainability in landscape design should discourage changes in areas where established landscapes have historic significance. If these areas require a higher level of maintenance, then perhaps this can be balanced with new, more sustainable landscape elements elsewhere on site.

These are basic principles for landscape designs to consider for the guidelines:

1. Design planting schemes to mediate seasonal weather conditions while remaining in keeping with the historic landscape design of the property.

2. Select drought-tolerant plant materials that convey similar characteristics to those used historically.

3. Design irrigation systems to maximize efficiency and minimize loss of water.

### Water Conservation Systems

Water collection devices, including rain barrels and cisterns, should be addressed in landscape guidelines. In most cases, this equipment can be placed in unobtrusive locations on a site and not affect historic structures or landscapes. In some situations, however, the design of the container, or the method of screening, will be topics for which to provide guidance.

Other water management devices may be included in new landscape proposals. If site improvements are part of the commission's purview, then these should be considered. In many communities, the objective now is to retain water on site and facilitate percolation into the soil. This reduces the need to use treated water for irrigation and also lessens the impact on storm sewer systems. Use of porous paving materials and design of water detention areas may be approaches that owners will seek to use.

These are basic principles for water conservation systems to consider for the guidelines:

1. Design water detention and percolation systems to be visually compatible with the historic landscape traditions of the property.

2. Use porous paving designs that facilitate percolation of storm water and that will be visually compatible with the property.

3. Locate new water conservation systems so that they minimize visual impacts on historic resources.

### Other Specific Design Issues

The preceding checklist highlights some of the design topics that have frequently appeared before commissions, or that are now emerging as property owners explore new sustainability approaches. There will be others. This list should not be considered definitive. And therefore, once again, it is important to state the broader intent of retrofits for green building, such that, as other new techniques emerge, the commission's guidelines will be framed to address them, at least in their basic principles.

Now, with this sampling of design criteria for sustainability in mind, how might a commission approach publishing the guidelines?

## WHAT ARE THE WAYS TO PUBLISH "GREEN" GUIDELINES?

There are three ways a commission might publish sustainability guidelines for historic preservation: (1) Weave the material throughout a comprehensive set of preservation guidelines; (2) Group them in a new, stand-alone chapter in the guidelines; or (3) Issue them as a separate brochure or booklet. Each approach has merit, and the appropriate choice will be influenced by the format of the community's existing preservation guidelines, the time and budget constraints, and the relationship to other publications related to sustainability that the community plans to use.

Here are some specific considerations for each approach:

### Option 1: Integrate Sustainability throughout the Preservation Guidelines

Integrating sustainability principles throughout each section of the community's preservation guidelines means that these principles can be discussed for each of the design topics that are usually addressed. For example, green principles related to building materials would appear in the section already dedicated to that topic, and guidance related to windows and energy conservation would simply be incorporated in the section that presently addresses their treatment. It also allows the commission to highlight the ways in which the basic principles of preservation that the commission has been using are fundamentally green, such as the principles for preserving existing features and repairing rather than replacing materi-

als, which appear frequently throughout typical preservation guidelines.

**Advantages of this approach:**

- It embeds the green ethic in all preservation design topics.
- It allows the commission to highlight how many of the existing guidelines already are "green."
- It is a more integrated approach, demonstrating that sustainability is an inherent tenet of preservation.

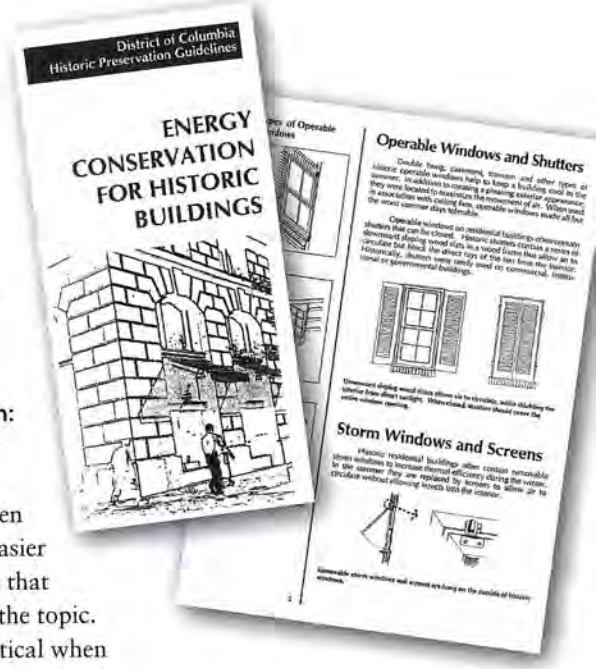
**Concerns related to this approach:**
If sustainability principles are to be integrated throughout existing guidelines, it will require substantial editing to weave the new material in, and it may necessitate a complete re-write of the document. This option, therefore, is a preferred approach when the existing preservation guidelines are due for a major overhaul. Many communities are reaching that stage with their guidelines and this may be the best opportunity to strengthen green building principles throughout.

This approach also may be a bit too "subtle," for attracting positive public attention. If the commission seeks to noticeably demonstrate its support of green building initiatives, the integrated guidelines approach may not be as dramatic as other options, in which the sustainability guidelines stand alone, and therefore are more prominent.

### Option 2: Place Sustainability Information in a Special Chapter of the Preservation Design Guidelines

Another option is to concentrate all guidance related to sustainability in a stand-alone chapter of the community's preservation guidelines document.

In this case, all green building principles would be contained in this one location. This could include the preliminary overview discussion of general sustainability principles outlined above. It could also define the steps in developing a green building strategy for the property, and then present the more detailed guidelines related to individual building components and technologies.




The Historic Preservation Office of Washington, D.C. published its guidelines as a series of brochures, each addressing a single design topic. One of these discusses energy conservation.

**Advantages of this approach:**
By compiling the sustainability discussion in one place, it will help to focus attention on "green building" issues, and make it easier to quickly convey to the public that the commission has addressed the topic.

This also may be more practical when a full re-write of the existing guidelines isn't merited or is not feasible. This approach is often easier to execute because the chapter can be crafted on its own without affecting existing chapters of the guidelines.

**Concerns related to this approach:**
Writing a separate chapter for sustainability may, however, fail to show how the existing design guidelines inherently contain sustainable concepts.

This approach may also tend to focus only on technology issues and miss some of the broader points related to sustainability that would normally appear in introductory materials in a guidelines document. To compensate for this, however, cross-references to existing guidelines could be included.

### Option 3: Develop a Separate Brochure

Finally, some commissions may publish sustainability guidelines in a separate fact sheet or brochure. A few commissions produce all their preservation guidelines this way, as a set of independent papers on individual building components or design topics. They may already, for example, have a series of brochures that address treatment of windows, building materials, and the design of additions.

An example is a brochure on guidelines for energy conservation published by the District of Columbia Historic Preservation Office, entitled *Energy Conservation for Historic Buildings*. This 12-page document is one that makes up a series in office's design guidelines system.

**Advantages of this approach:**
A brochure is relatively easy to produce, and it can be made accessible to property owners rather easily. Other departments and agencies can distribute the document as well, and therefore it may gain wider exposure. If the city has established an office of sustainability, for example, the brochure can be distributed through that office, in addition to the normal channels for preservation publications.

**Concerns related to this approach:**
A brochure may not provide the integrated view that a more comprehensive approach will. It is difficult to provide the same level of information that a full chapter dedicated to the topic, or an integrated document with a preamble addressing strategies and basic principles, can offer.

## QUESTIONS TO CONSIDER

### Will introducing sustainability principles require changes to existing guidelines?

Guidelines for sustainability build on the fundamental principles that appear in typical preservation guidelines, where the focus remains on protecting the

significance of a property and retaining its integrity. A major change is not likely to be required.

However, if the existing guidelines express a rather conservative approach to new technologies and other alterations that may be visible, some changes may be needed. If, for example, the guidelines prohibit installing solar collectors that would be visible from the street, additional flexibility may be needed. Some commissions have indicated a willingness to allow panels to be visible, as long as they don't detract from the building's historic character. In this case, revised guidelines should focus on ways to install collectors in the most appropriate manner, by considering which portions of the property may be least affected by the appearance of the collectors, but in the process acknowledging that some change in appearance may occur.

This approach assumes that the commission generally accepts compatible alterations when other types of modifications are made to a historic building, such as adding a new wing or installing features that improve accessibility. This thinking would then extend to sustainability measures as well. The threshold for allowing compatible alterations may be higher for "contributors" to a historic district, especially individual landmarks and those buildings in which key character-defining features are particularly sensitive. On the other hand, there may be even more flexibility afforded to alterations to noncontributing structures and to new infill buildings within historic districts.

### How will the green preservation guidelines relate to other sustainability regulations in the community?

Other local programs and regulations may affect the design guidelines. The most obvious influence is the use of energy performance certification standards. Many communities, and some states, have adopted energy performance standards that apply to new construction as well as substantial renovation projects. Some of these acknowledge that historic buildings merit different consideration, but nonetheless the intent is that all buildings achieve targeted standards for energy savings and sustainability, in general, at various levels. Even where requirements are not in place, many owners seek certification through voluntary programs, such as the Leadership in Energy and Environmental Design (LEED) program sponsored by the Green Building Council.

At a minimum the preservation guidelines should avoid placing obstacles in the way of achieving these standards, and ideally the guidelines should help owners meet these requirements while also demonstrating best practices in preservation in their projects. The point is that the preservation commission needs to be aware of energy performance requirements when drafting green guidelines for preservation, and to signal its interest in supporting them.

**GUIDELINES for sustainability build on the fundamental principles that appear in typical preservation guidelines, where the focus remains on protecting the significance of a property and retaining its integrity.**

### Do green building guidelines apply to all resource types?

Many assumptions about the durability of materials and inherent operating efficiency of historic buildings apply best to buildings constructed before the Second World War. Resources constructed since then may require a different approach, or at least a clarification of how the concept of "integrity" is applied to these properties when considering retrofits for energy conservation.

Some of the original materials found on buildings from the recent past may not be as sustainable, and when replacements are needed, may require consumption of huge amounts of energy to reproduce. And others may inherently consume substantial amounts of energy to operate. For example, a high-rise office building with a curtain wall system, (which involves metal components holding large glass plates in place) may be more difficult to retrofit, at least in terms of external modifications, without affecting the integrity of the property. Sometimes internal refinements to the mechanical and electrical systems will be the best approaches for improving energy efficiency for these property types.

Dealing with small, strip commercial buildings may also be different. These were constructed during an era of cheap energy, and with the assumption that mechanical heating and cooling systems could overcome any regional differences in environmental conditions. Un-insulated walls and large glass surfaces will pose problems in these building types. Nonetheless, some successful case studies demonstrate the reuse potential of these resources. Finally, some mid-century buildings, because they were erected during an era of relatively cheap energy, lack the regional design features that address local environmental conditions.

### How specific should the guidelines be about green technologies?

It may be tempting to put forth statements about what specific technologies or design approaches are "appropriate" and "inappropriate" when it comes to green building. But, as these technologies change (and they will), the guidelines may become outdated quickly. In order to extend the shelf life of new sustainability guidelines, it is important to state the intent for the outcome of the particular design topic first.

### What should be the tone of the guidelines?

As with all effective preservation guidelines, the tone should be positive and solution-oriented. Guidelines that only state what is not permitted simply frustrate users and convey a negative message. They also are difficult for commissioners to use in weighing alternatives in a project proposal.

A positive tone is even more important when addressing green building topics, if preservation is to be considered an ally in this movement. The guidelines should help define appropriate designs, and not be seen as limiting choices.

If the focus remains on applying the basic preservation principles of identifying key features and maintaining them, then solutions will be available. With that process, secondary elevations and other less sensitive places can be identified to accommodate many sustainability-oriented improvements.

### Who should participate in writing the guidelines?

Commission members and their staff, as well as consultants, will play major roles in drafting the guidelines; others with interests in preservation, design, and sustainability should participate as well. They may join in focus groups, special working committees, and public meetings.

It is always wise to engage the public at large in writing preservation guidelines, and sustainability topics will attract especially strong interest. Community workshops and commission study sessions provide good venues for public involvement.

Many people may join in the process with specific concerns, such as how windows will be treated, or how solar collectors will be accommodated. Others will participate because they have a strong interest in the general topic of sustainability and wish to see it receive appropriate treatment in the preservation program.

#### Preservation advocates

Of course, local preservation groups, including nonprofit advocacy organizations and neighborhood associations, should be major participants. This provides an opportunity for them to learn more about green building strategies and also to help test ideas for specific guidelines as these emerge in the process.

**ALL TOLD, this should be viewed as an exciting opportunity to improve the design review process and help all players, including property owners, staff, and commissions, reach clear, understandable decisions.**

#### Sustainability agencies

Many communities now have a formal office of sustainability, or at least a staff person within another department who has this as a key responsibility. It is essential that these interests be included in meaningful, interactive discussions about achieving mutual objectives.

#### Industry representatives

It also is useful to include representatives from industries that market and install energy-saving systems and offer other sustainability measures. This will ensure that the guidelines adequately anticipate emerging technologies. It also provides a chance to gain a perspective on how these services are promoted.

## CONCLUSION

Addressing sustainability in preservation guidelines should be a top priority for all commissions. Initially this may be as simple as underscoring the green building principles that are inherent in most existing guidelines, but commissions should take steps to move beyond that point, to provide clearer guidance to users.

Whichever approach is used, it is important to distinguish the type of information that may be provided. Some discussion about basic principles of sustainability is more educational than regulatory. This can be helpful in laying the grounds for an informed evaluation in the design review process, but it should not overload the document or be considered a substitute for clear guidelines. That is to say, a lengthy theoretical treatise or a highly detailed technical manual is not a substitute for clear, direct guidance.

Similarly, it may be tempting to include a lot of facts about the performance of certain systems (such as windows, or solar collection systems). This approach should be treated with caution. Technologies continue to evolve, and the data frequently change. Focusing more on broader principles and the intent of the outcomes desired will keep the document sound in its policy.

Finally, commissions should consider this an opportunity to refresh their thinking about their design guidelines in general. If a major update is in store, then the process of organizing thoughts about sustainability will also trigger refinements to other long-standing policies. For example, when addressing green building design, evaluating the difference between mid-century property types and those constructed in earlier periods is a challenge. This may stimulate updates to other guidelines.

Similarly, the commission may want to re-evaluate its existing landscape guidelines, given increasing interest in constructing rain gardens and drought-tolerant plants.

Even if the sustainability guidelines are to be developed in a more limited fashion, it still provides a chance to re-affirm how the body of the existing guidelines can help in addressing sustainability questions.

All told, this should be viewed as an exciting opportunity to improve the design review process and help all players, including property owners, staff, and commissions, reach clear, understandable decisions.

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