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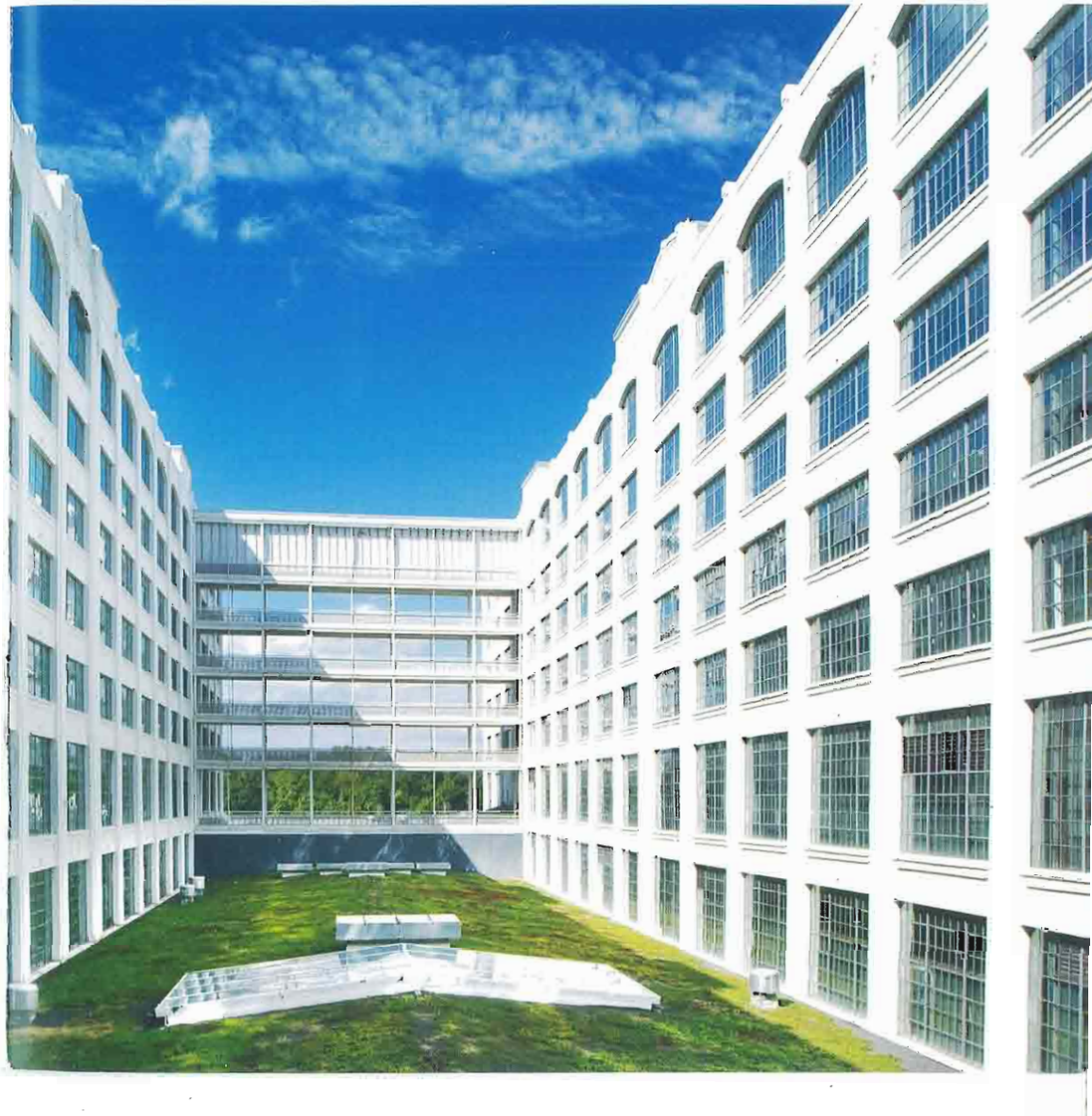
POSITIONING PRESERVATION IN A GREEN WORLD



The National Trust's Sustainability Initiative will help share best practices for advocacy and education, such as this idea from Baltimore Heritage, Inc.: a "Green Tour" of an older home that incorporates energy-efficient features. Photo courtesy National Trust for Historic Preservation.

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- Higher density is a key element of sustainable development—but efforts to increase density, especially in urban locations accessible to mass transit, sometimes put historic buildings and neighborhoods at risk.

Situations such as these pit "good guys against good guys"—but we can't let them cripple our efforts. Be assured that preservationists are committed to reexamining our practices, committed to thinking critically and creatively about how they can be improved to reflect the realities of the climate change crisis.

As an indication of our commitment, we will soon open the National Trust for Historic Preservation Green Lab on the West Coast. The Preservation Green Lab will undertake demonstration projects to retrofit historic buildings to achieve high levels of energy efficiency and reduce other environmental impacts. The Clinton Climate Initiative, which recently announced an Energy Efficiency Building Retrofit Program, is a partner in this effort, having committed to provide technical assistance, materials at cost, and favorable financing through participating lenders.

The Preservation Green Lab will also work with state and local governments to make sure that municipal plans, building and zoning codes, and "climate action plans" incorporate principles that support reuse, reinvestment, and green retrofits. Here's a specific example: In Seattle, many landmarked buildings are exempt from high-performance energy requirements that are imposed on new construction or major rehabilitation projects. To address this concern, the Green Lab will work in partnership with the City of Seattle to develop code language that encourages energy efficiency in historic buildings while providing the flexibility needed to deal with historic fabric and other complexities associated with older buildings. This is just one way in which we intend to make our Green Lab a true laboratory for generating creative policy and technical solutions to help integrate preservation and green building practices.

The preservation and green building communities share a common goal: securing a viable, sustainable, meaningful future for our children and the generations that will follow them. We stand on common ground—but to ensure that we don't lose our footing, two things are needed:

First, a recognition of the importance of balance between the need to preserve our heritage and the need to address global warming and the degradation of our environment;

And second, a commitment to honest, open, and ongoing dialogue to identify points of difference and find ways to overcome them.

In the face of an unprecedented global challenge, we have an opportunity to forge an unprecedented partnership. Working together, we can make a real difference.

Richard Moe is the president of the National Trust for Historic Preservation.

POSITIONING PRESERVATION IN THE CENTER OF THE GREEN ARENA

By Steve Tilly

Climate change has put us all on the defensive. Preservationists, in particular, are defending their sites and their value system. On the one hand, they are devising physical defenses for historic resources threatened by flooding and other effects of global warming, and on the other, they are contending with green "assaults" on historic windows, roofs, finishes, or entire buildings.

It does not appear that the green movement is about to unilaterally celebrate preservation as a key strategy against climate change. It's time, then, for preservationists—or better, in this context, "heritage conservationists"—to move from the defensive to the offensive and inject ourselves and our insights aggressively into the green arena. We need to bolster our intuitive grasp—our "Blink" in writer Malcolm Gladwell's term—of the environmental importance of existing infrastructure, community networks, and landmarks and resources of memorable built and open space. We belong in the center of that arena, for reasons I will try to spell out.

First, the crisis. There is powerful motivation to support preservation in the shortened time frame imposed by our climate crisis. While sustainable thinking should play a key role in sensible planning for several generations hence, our window of opportunity to avoid dire consequences is *one* generation or less. Ongoing climate change is a given because of the long-term carbon load already in the atmosphere; to avoid catastrophe in the longer term we need to take actions to reduce greenhouse gas emissions dramatically in the next 10 to 15 years. Green preservation, unlike new construction, can be the light-touch process that delivers necessary reductions within that short time frame.

THEM AND US

The seriousness of the crisis overshadows the realms of contention. The conflict between green and preservation thinking fuels debates on topics ranging from the construction details of windows to the demolition of a hospital in New Orleans to locally fabricated solar collectors proposed for roofs in a historic district in Cairo, Egypt. The friction is exacerbated by an increasing reliance on checklists and rating systems on the green side, and by the inflexibility of historic guidelines, or at least of their interpreters, on the heritage conservation side.

Both movements share a related origin, reflected even in the terminology—that is, "conservation"—and a related and overlapping demographic. So what is the conflict about? The two working definitions of "conservation" and "conservative" (in the nonpolitical sense) seem to be at odds with each other. Green advocates are convinced that climate change trumps all and often

define preservation as fussy, out-of-date obstructionism. Preservationists, on the defensive, push solar panels away from the street side and muster what limited data they can in skirmishes over replacement windows, recladding of exteriors, and the dismantling of buildings for their parts (the architectural equivalent of "organ harvesting").

Preservationists should also be pressing the green community to recognize heritage, the irreplaceable "embodied history" historic properties possess, as a fundamental value in their discourse as well as their rating systems.

That's where we are right now in the debate about preservation and green, and the rightful relocation of heritage conservation to the center of the green arena depends on advocates mastering the tools and terms of that arena and pressing the green preservation case vigorously. If we are right, we will be correcting serious deficiencies in the international discourse on sustainability and prodding the green world to take a more holistic view. If we are right, we should demand and welcome better ways of measuring the comprehensive carbon (especially) consequences of our actions.

We should use our insights into the technics and behavior of structures over time to forge robust but sympathetic measures for greening historic buildings. Though old buildings have many virtues, they still guzzle fossil fuels. The equipment part of the solution is relatively easy: new condensing boilers, for example, are smaller, quieter, and much more efficient than their predecessors and can usually be inserted without jeopardizing historic fabric. For the building shell, the knowledge bases of preservation technologists and green building scientists are converging. Conservators can help preservation architects fashion innovative techniques for introducing insulation, air sealing measures, and heating and cooling distribution systems into historic structures without harming their integrity. They can also alert property owners to the often passive climate-controls built into historic buildings. We should take pains to demonstrate the value of new and old heritage-conserving techniques for the building stock in general. Preservationists should also be pressing the green community to recognize heritage, the irreplaceable "embodied history" historic properties possess, as a fundamental value in their discourse as well as their rating systems.

The green community has (understandably but unfortunately) seemed myopically focused on building operation and performance, as though those occur in isolation from a political economy and larger carbon cycle. On the one hand, this is understandable, because addressing the single building problem is a lot easier and building operation is a simpler, cleaner subject than the full life cycle of a project in its context. Yet it is unfortunate, because many decisions are being made using insufficient or inaccurate data, and mistaken impulses and habits have built up a lot of momentum.

GO BEYOND CHECKLISTS FOR DEEPER UNDERSTANDING

Buildings are the products of swirling processes of decision-making concerning the development of infrastructure, and the movement of people, goods, and capital. It is vastly more difficult to understand and quantify this whole ecosystem than a single building or project. Our current quantitative tools and data are as yet not up to that challenge.

Almost without exception, green rating systems do not account for cultural, architectural, historical, social, political, and economic significance. I'm not suggesting we abandon those tools, but rather that we use them cautiously and not abandon our common sense. We need to take checklists, point systems, and quantitative tools as far as they go and then use our own well-developed intuitions to make educated guesses about the course that best addresses all of our concerns: climate, culture, community, and economics among them. (See sidebar on page 20.)

The data used in Life Cycle Assessment tools and some rating systems—for example, the total energy involved in getting a two-by-four into a wall on a job site—are largely gauged by expert estimates, since actual field measurement is so difficult. It takes significant energy inputs to restore order to sites and communities after the disorder or entropy introduced by large projects. Preservationists should press for research to identify the full environmental costs of the demolition and new construction cycle, and for those costs to be included in impact assessments.

ESTABLISH THE TRUE ENERGY LIFE CYCLE OF BUILDINGS

The construction of new buildings has a significant greenhouse gas footprint resulting from the energy required to extract, process, manufacture, transport, and assemble the materials. This is often referred to as "embodied energy." "Energy history" is a more descriptive term for ***spent*** energy since "embodied" suggests a potential for conversion into new energy where there is none.

Life cycle studies assume the lifetime of a building or its components to be 50 or 75 years or more. Since most construction energy is expended at the outset, a longer stipulated lifetime will make construction energy look smaller in relation to the total of the energy consumed running the building. (By contrast, the shorter the time frame, the smaller the total operating energy consumed as compared to the embodied energy that was expended for construction).

If you look at the life cycle of buildings, you can measure the time it takes to balance the construction energy spent at the outset with the energy subsequently saved in its operation. In other words, you can identify the time it takes to break even, from an energy or greenhouse gas point of view, and start going into positive territory.

A small scale example of this principle is the manufacture of a compact fluorescent light bulb, which Danish scientists estimate starts saving energy and reducing emissions after the 50-hour mark, if one takes into account its energy history to that point. At that point the savings of using it versus the less efficient bulb it replaced equals the energy required to make the bulb. Clearly the bulb replacement is a good decision. It delivers a carbon reduction early, when we need it.

But what about building replacements? International studies, notably in Scandinavia, Europe, and Australia, suggest that the greenhouse gas break-even point for new building construction is generally in the 15- to 25-year time frame. In other words, it is only after that period that the project results in a *reduction* in emissions; prior to that

MORE ON GREEN RATING SYSTEMS

Checklists sprang up as guides to green living. They evolved into point systems and then into more subtle and sophisticated weighted point systems. The U.S. Green Building Council's LEED rating systems are preeminent in the U.S. In the U.K. the dominant system is BREEAM, which predates LEED. Green Globes started in Canada and has moved into the U.S. market. There are many, many others. SB Tool, for one, is a comprehensive international toolkit for fashioning your own regional green metric; it is the only system to even list cultural heritage and historic preservation as a variable to be considered.

Like all systems that attempt to codify a messy, dynamic reality, green rating systems miss some things badly and get others wrong. Some within the green community believe LEED is too close to the marketplace and not rigorous enough. Other critics, who believe that curbing energy use and greenhouse gas emissions is paramount, point to studies showing that in these areas LEED buildings perform no better than average.

Rating systems including LEED are not yet reliable guides to climate change impacts, life cycle footprint issues, or the complete accounting of energy flows and consumption of a project. With support from manufacturers, suppliers, and other entities tied to the real estate and construction industries, rating systems have historically been geared toward shifting the new construction market to more sustainable practices. Researchers and consultants to the green building community are beginning to develop Life Cycle Assessment tools, which are also currently most easily used out of the box for new construction.

LEED 2009 rewards smart growth policies more heavily, a plus for older neighborhoods and infrastructure. However, it reduces the percentage of points allotted to the retention of existing buildings, though alternative pathways are said to be under consideration for historic structures.

The LEED system has so successfully captured the marketplace in the U.S. that like Kleenex and Formica it has started to become synonymous with its product type, and like them, it faces losing control of its brand and becoming generic as it gets mirrored and referenced endlessly in new guidelines and codes. Previous reforms such as the public health movement in the early 20th century resulted in a spate of new laws and codes, including contemporary building and sanitation codes. It is likely rating systems will give way to more fully fleshed-out descendents of new "green" codes the rating systems are now spawning.

At some point LEED and other systems will disappear into advocacy and educational enterprises as 21st-century building codes take over and carry on the evolution of the rating systems' DNA. It is important to act now to make these systems more responsive to green preservation concerns, to lobby for a more inclusive LEED while it is still a dominant force, so that both present guidelines and future codes promote the retention rather than the disposal of historic places.

break-even point the energy used in building the project creates an *increase* in emissions.

These figures do not include the emissions resulting from demolition of existing facilities, which would move the break-even point out further. Full demolition impact accounting would include the energy required to deconstruct or demolish the structure, mitigate its impacts, move the debris and salvageable elements elsewhere, and maintain the disposal site—not to mention accounting for the disruption of the surrounding context caused by demolition and construction activities.

We must scrutinize new construction projects to evaluate their short-term climate change impacts and raise questions when a Life Cycle Assessment shows a positive impact only well out into the century. Perhaps new construction projects should only be permitted if they are paired up with other projects that more than eliminate the initial project's short-term carbon debit. Then the major new green project would be just the most visible of several resource-conservative interventions, including some small-scale ones that otherwise would not have happened.

My own preference would be for a specific pairing of immediately available projects, not a more elusive green credits marketplace analogous to "cap and trade" programs in which polluters buy permission for "ungreen" practices by funding compensating green projects. For example, permission to build a new sports complex which would be a net CO2 emitter for 20 years might hinge on weatherizing a nearby block of old buildings that would be a net CO2 saver over that same period and more than compensate for the losses.

WORK ON IMPROVING THE EXISTING INVENTORY

At best, new green buildings will only make things worse more slowly, even if they actually perform as planned. They may house new uses better and have a smaller environmental footprint, but they do not cut down on the current energy usage of existing occupied buildings, which is producing a large share of greenhouse gas emissions. In the United States, the building sector is responsible for 43 percent of our total energy consumption and greenhouse gas emissions (GHG) and 75 percent of our electricity use.

The United Nation's 2007 Intergovernmental Panel on Climate Change (IPCC) Report identifies buildings as the sector offering the greatest opportunity for cost-effective mitigation of greenhouse gas emissions:

> *To sum up, while* ***buildings offer the largest share of cost effective opportunities for GHG mitigation among the sectors examined in this report,*** *achieving a lower carbon future will require very significant efforts to enhance programmes and policies for energy efficiency in buildings and low-carbon energy sources well beyond what is happening today....Over the whole building stock* ***the largest portion of carbon savings by 2030 is in retrofitting existing buildings*** *and replacing energy using equipment due to the slow turnover of the stock.* [emphasis mine]

This argument leads to the conclusion that the most productive thing we can do in the principal sector—North American buildings—is a program of careful preservation and greening that delivers its benefits within a relatively short time frame. We can't

simply sit on our preservation laurels and extol the virtues of saving old buildings; the preservation technicians in our community need to pioneer sympathetic techniques for reducing the energy use of existing buildings, whether they are landmarks or background buildings.

And so, we need to put on hold some bold, massive projects that would otherwise be desirable, because of their climate change impacts within the next 10 to 15 years. We do need to grow our building stock, and we should be looking first to accommodate that growth within the existing building inventory, being as thrifty and clever as possible. We should pair up symbiotic uses in structures so they are fully utilized through the day and week (such as, apartments over the store), and we should scrutinize the need for and efficiency of every square foot we plan to build. These are very hard lessons for most of us in the building sector: developers, investors, architects, contractors, unions, and politicians. They are easier lessons for heritage conservationists, who have to lead the way, not obstruct or retreat.

Conservation, as opposed to consumption (albeit green consumption), has fewer powerful friends and well-heeled natural allies in our recent (past) economy. The current financial crisis now may foster more receptiveness to the green preservation approach I am describing. Small-scale improvements to existing buildings (such as air sealing of enclosures, weather-stripping doors and windows, insulation, and equipment calibration) require a relatively low expenditure of energy and a relatively high amount of human labor. They require little lead time. The break-even point for smaller scale interventions is within the critical climate change window of opportunity; and a widespread program could create many jobs per dollar of investment.

Preservation regulators at federal, state, and local levels need to become familiar with green strategies, technologies, and terminologies. They should be able to defuse apparent conflicts and draw on the conservation heritage common to the green and preservation worlds in making and explaining their thinking as they interpret design guidelines.

ACTION STEPS FOR PROMOTING A GREENER PRESERVATION AGENDA

All of this leads to a green/preservation/jobs agenda to be promoted by the preservation community. Specifically, we should:

1. Commission a major research effort to identify clearly the current carbon footprint of all activities related to construction and building operations. I am confident that our commonsense assertions are valid: Improving the energy efficiency of existing buildings is the first way to slow climate change and will produce jobs for communities. However, when I look beyond common sense, there is an information vacuum.

Long term, we will *forever* need to consult and refresh data on energy sources and conservation measures in the developed and developing world. As with all dynamic life cycles, we cannot afford to be stuck on "safe" formulas concocted to explain a previous crisis.

Some data exist in various government agencies (e.g., the National Renewable Energy Laboratory), private companies, and nonprofit consulting entities in the United States and Canada. Significant work on embodied energy is underway in the United Kingdom (e.g., University of Bath) and Australia. The data from abroad are not necessarily easily transferrable to our economy, though with globalization, an understanding of those data is essential.

The most comprehensive embodied energy data, or energy history data, of building materials in the public domain in this country date back to 1967. A 1980 Department of Energy (DOE) report is still our most recent resource for the U.S., and it relies on the 1967 data. Updating this information and making it widely available should be an urgent agenda item for the incoming Department of Energy.

2. Develop more Life Cycle Assessment systems for building products. The Energy Star labeling system for appliances, equipment and buildings is one successful example. While the first need is good data for building professionals and the construction industry, the ultimate goal should be a labeling system that indicates to everyone, including the general public, the life cycle data for a particular product. Ideally, products would carry a greenhouse gas label covering their manufacturing as well as their operational footprint. The DOE could promote this in the same way that the FDA promotes nutritional labeling. The theoretical difficulties this goal presents are formidable, but we should attempt to solve them.

We all need help deciding on what we can do that will truly lessen the climate crisis—rather than vaguely and uncertainly groping around, buying bamboo towels, and hoping we're doing some good.

3. Train preservation students in the array of gentle greening approaches needed to improve our old and historic building stock.

4. Have trade schools, utilities, unions, government agencies, and nonprofit organizations train many people in the techniques required to weatherize existing buildings. Preservationists should contribute to those training programs to ensure they cover low-impact strategies that will preserve the integrity of historic properties.

Preservationists need to stay abreast of the green cutting edge, and we need to press for technologies that can help make existing buildings more green quietly and gently. Advances in the construction of new windows, as one example, will put more pressure on preservation advocates urging the retention of existing ones; it will soon no longer be sufficient to argue that a storm window over a solid old window will suffice, particularly in projects where energy loads are dominated by windows (there are many). We need advanced, low-embodied-energy weather-stripping, and an industry that will help us continue to improve the performance of our retrofits to keep pace.

More and more voices, at higher and higher levels of power, are sounding the green building theme. Preservationists can help call for the data and tools needed to focus this energy and put it to work where it can have the most positive environmental impact. They can also provide the knowledge and skill to show that not only is heritage conservation consistent with a sustainable future, it is essential to getting there.

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