

From Red Dinosaurs to Green Exhibitions

by John W. Jacobsen

John Jacobsen is CEO and Co-PI, the White Oak Institute and President, White Oak Associates, Inc. He is also the Co-Chair of the Professional Interest Committee for Green Museums (PIC Green). He may be contacted at jjacobsen@whiteoakinstitute.org

Lean museum projects are often quietly green.

Green is the latest value to join a planning table already crowded with other pressing priorities. Many museums want to be green and want to help their communities become green, but the deeper benefits from making foundational changes in how we develop museum projects still need to be better understood. The key lies in sustainable thinking at the start of museum planning, not just in green material and fabrication choices at the end.

An overview of past and recent practices introduces the basics, and the rest of this article compares traditional ways of thinking to greener and more sustainable ways. This is not just about new buildings; any existing organization and scale of museum project can “Go Green.”

Lean museum projects are often quietly green. Without lavish budgets, old stuff is re-used, local labor and products are incorporated, toxic and/or complicated fabrication is out-of-the-question, and the re-use of every capital expenditure is considered. Yet people still aspire to “world class” and “museum-quality.” Traditionally, achieving these qualities has involved big budgets, big egos, big buildings, big exhibit contracts, and very big, red-hot carbon footprints – red dinosaurs. Today, cool green is wrapped around many museum development projects, but the expectations for achieving traditional museum-quality have not gone away. To move further toward cool green and to help our bottom lines, large-scale museum development has a lot to learn from shoestring development. The starting point is the humility to think smaller, but longer and deeper, and then to re-define “museum-quality”

from this leaner and greener perspective.

Red Dinosaurs: Our Legacy

In the spring of 1990, 120,000 ft² of exhibits were thrown in the trash, and I still feel guilty. DECWORLD '90 played for 10 days at Boston's huge World Trade Center for thousands of people who had flown in to see the \$10 million (1990\$) extravaganza of exhibits and mini-theaters, all showcasing Digital Equipment Corporation's latest technologies. We had designed it with modules to be reused, but storage costs were not covered anywhere, so tons of particleboard, high-end laminates, Lexan, copper wiring, fiber optics, and plastic potted plants were thrown in the garbage.

This was in sharp contrast with my earlier experience as a scenic designer in the theater, particularly in summer stock when we would do a Broadway musical or play a week on tiny budgets. Every flat, platform, door frame and step unit in the old barn was inventoried, re-used, re-painted with powdered paints mixed with animal hide glue (cheap!) and bolted back together overnight in new combinations to become the Court of Camelot or an Edwardian drawing room.

My theater background has also helped me understand that an empty box is not the most flexible space. The best legitimate theaters are those with the best built-in systems and relationships that get used and re-used, like standardized lighting control systems, orchestra pits, support grids and relationships with subscribers who want to come weekly to see the new show. So it will be, I expect, for green and sustainable museum galleries and immersive theaters.

U.S. and Canadian Green Museum Building Projects by Discipline

2008 Actual and Intended Projects

| | |
|------------------------------------|----|
| Art Museums | 15 |
| Children's Museums | 19 |
| History Museums | 18 |
| Science Museums | 32 |
| General/Interdisciplinary | 8 |
| Green Museum Initiatives in Sample | 92 |

Table 1

Source: USGBC and White Oak Associates, Inc.

This does not claim to be a definitive count

This 2008 representative tally is based on the US Green Building Council (USGBC) plus the author's awareness of additional upcoming projects.

While we hope that nothing like the trash from DECWORLD '90 happens today, traditional approaches to museum development seldom include consideration for what it will take to sustain relevance over time, much less what happens to the materials involved after their useful life. Large museum projects, particularly ones with grand public aspirations and significant budgets like those listed in Table 1, still seem to offer donors, architects, designers, and even museum managers the opportunity to make "permanent" statements on prestigious platforms to the great public at large. In most cases, opening year finds everyone happy, but, in practice, it is seldom long before museums feel the pressure to change, and another round of "permanent," iconic statements starts down the long road to becoming tomorrow's trash. With all the big-wigs and money involved, who has the temerity to ask up-front that provisions be included to dismantle their ego statements so that the parts can be used for other statements by other people? And what future egos will be content to work with someone else's left-overs? If you are a museum developer committed to green, the answer to both questions is "you."

The museum boom of the '90s expanded existing museums and created new ones, many with vast volumes of space housed in star architect buildings clad with custom glass and exotic materials. The high-end projects, including some I am involved with, are still

building grand exhibit halls, 20 to 30 feet tall, and filling them with huge and expensive exhibitions ranging in cost from US\$141-\$395/ft² for static and \$339-\$791/ft² for interactive exhibitions (West, 2004, adjusted for four years inflation by the CPI). We do it the old way because large-scale galleries and expensive, long-term exhibits are what many funders and perhaps the visiting public regard as "museum quality," and because we do not yet have alternatives with proven appeal.

Ever since DECWORLD '90, I have entered each museum development project wanting more green than the compromises that made it to opening day. We've made some progress, but in the end, value engineering, entrenched expectations and established ways of doing things erode these intentions. Why? How do we change?

Green as a Museum Movement

Concern over environmental sustainability has been growing for decades, and recently seems to have reached a tipping point among community leaders who are embracing the concepts because of a somewhat surprising finding: Green is also good business. At last, the connection has been made between environmental sustainability and financial sustainability.

The museum field has certainly picked up on the movement. White Oak's database

The starting point is the humility to think smaller, but longer and deeper, and then to re-define "museum-quality" from this leaner and greener perspective.

Green is also good business. At last, the connection has been made between environmental sustainability and financial sustainability.

(continued from page 7)

Editor's note: See the LEED chart on page 65 of this issue.

includes 92 museums considering or actively building green projects including categories of museums, as represented in Table 1. Some of the projects are pursuing LEED certification (Leadership in Energy and Environmental Design, a point-based evaluation by the U.S. Green Buildings Council).

While LEED certification has caught the spotlight in the US and Canada, there are other systems. The International Standards Organization (ISO) maintains ISO14025 as a system of measuring environmental impacts. Stanford University has its own set of standards, and several museum projects like the Peoria Riverfront Museum are avoiding the costs of LEED certification, but following the principles.

However, green initiatives do not require new architecture. In fact, green initiatives have to start modestly, at home. "Green" and "sustainable" are strategic values—an evolving way of thinking about the impact of each choice. Common to definitions of "green" and "sustainable" are two critical assumptions for the environmental movement: we bear responsibility for the impact of our current actions upon the future; and, everything is connected. Sarah Brophy and Elizabeth Wylie's excellent new book, *The Green Museum: A Primer on Environmental Practice* (see the review in this issue) defines the distinction between the two words:

Green refers to products and behaviors that are environmentally benign, while sustainable means practices that rely on or use renewable or reusable materials and processes that are green or environmentally benign. Green is akin to "do no harm," and sustainable is comparable to "do no

harm and keep the patient alive." (Brophy & Wylie, 2008).

Following the everything-is-connected logic, some museums have adopted Triple Bottom Line (TBL) accounting as a way to evaluate their economic, ecological and social performance (Elkington, 1994), or impact on "people, planet and profit." Long-term sustainability requires positive impacts on all three bottom lines.

A LEED-certified building and a set of low-impact policies work best when they come from the heart. A green museum must *want* to become green inside and out, while acknowledging the journey's challenges. The use of local, green suppliers, premium parking spaces for hybrid vehicles, bicycle racks, changing rooms, and approaches to facilitate exhibit change and minimize waste are just a few of the operating strategies that can help reduce a museum's carbon footprint and show the culture's commitment. Relatively simple changes to the physical plant reduce energy use, for example: evolving lighting fixtures to energy-saving lamps as the old ones burn out, consolidating space, upgrading mechanical systems, building shell enhancements, and a thoughtful selection of a number of thermal comfort zones, rather than trying to heat/cool the entire building floor to ceiling.

An excellent example of a green conversion of existing buildings, the Children's Museum of Pittsburgh, draws 100% of its power from renewable sources, and partially from its own 3 kWh photovoltaic system. All systems throughout the building are monitored and carefully controlled to maintain high quality indoor air. Steps are taken to control pollutants

that might be dragged through the facility. The renovation depended on reused building materials and high quantities of recycled materials that were locally manufactured and/or locally harvested. It has a white roof and considerable natural light. Their advice is: commit to the LEED process early, don't waiver in the face of complications and costs, and make sure that the LEED manager reports directly to the institution's management.



Natural light, natural materials (note wood floor, not concrete or carpet tiles), human-scaled and flexible components in this creative studio/exhibit area in the Children's Museum of Pittsburgh renovation make a comfortable and stimulating learning space. Courtesy of Jeanie Stahl.

Small is Good

Architect Sarah Susanka in her book *The Not So Big House* calls for thinking about a new kind of house, and her vision might be modified for museums:

It's time for a different kind of house. A house that is more than square footage; a house that is Not So Big, where each room is used every day. A house with a floor plan inspired by our informal lifestyle instead of the way our grandparents lived. A house for the future that embraces a few well-worn concepts from the past. A house that expresses our values and our personalities. It's time for the 'Not So Big House' (Susanka, 1998).

Is it time for the Not So Big Museum?

One of the most difficult adjustments in museum aesthetics may be a shift from the huge, heavy, and exotic to the more intimate, airy, and familiar. Major museums currently assume epic entrances and cavernous galleries, and this cubic footage costs more to operate, which in turn is largely responsible for a red museum's carbon footprint. I believe it is time for some of the galleries to be more intimate as part of a palette of spaces, small to large and low to high, with some dark and

more day-lit. If museums were significantly smaller, operating costs would reduce as would carbon impact. Looking at the equation from a community benefit perspective with regard to existing museum buildings, if your current museum were able to accommodate significantly more community services within the same volume, then per capita energy expenditures should decline.

Recycling Saves Money but Requires Different Processes

Recycling makes sense environmentally, but re-using exhibition components presents challenges to the design process, which is set up to start from a blank sheet of paper. Recycling demands that we start with a detailed knowledge of the elements that we will be re-using. If Digital Equipment Corporation, for instance, had stored the 120,000 ft² of exhibits, then the next group of designers would have to understand all the components in storage and how they might be reconfigured. How would they know *exactly* what size they were? Who would cover liability if the dimensions were wrong? Our current system of contracting design and fabrication is set up to start from scratch with all new "first-class" materials.



Made of light-weight cardboard and other green materials, Gyroscope's modular booth is small-scaled and designed for more personal, friendly exchanges—every picture can be picked up and looked at together. Courtesy of Gyroscope, Inc. (Oakland, CA)

(continued from page 9)

Is it time for the Not So Big Museum?

A commitment to recycling, on the other hand, calls for a very different process that involves individuals who are familiar with the inventory of recycled components, as I used to be with all those flats in the summer stock barn. Such individuals can then be responsible for reconfiguring that inventory to meet the needs of the scenario that can be installed on those components. In an important respect, it gets the exhibit developer out from behind a console, and into the field looking at overstocks of materials, collections of interesting pieces, sources of already-produced media, and historic artifacts that might be incorporated. There is a whimsical water fountain outdoors at the Pittsburgh Children's Museum that involves a jumble of architectural pediments, cornerstones and cornices; each historical piece has historic connections to Pittsburgh. This is not an exhibition drawn at a computer station, but rather, one found in the field and community, and assembled on-site.

Delta Tactics for Change

For many reasons, green being only one, community museums must frequently change their content and visitor experiences in order to maintain relevance. To keep costs down and to reduce waste, and with the help of colleagues,

I have been developing the *Delta Strategy* for changing museum exhibition galleries more frequently with better people, planet, and economic outcomes. In this framework, a *Delta gallery* is a public learning space with built-in infrastructure and an inventory of modular equipment (the experience platform) to facilitate a changing sequence of content scenarios and staff programs. The following diagram, adapted from Stewart Brand's *How Buildings Learn*, shows cycles of change for a Delta gallery:

Rethinking Budgets and Contracts

In order to reduce the demands on management time and decrease the risk, museums often seek comprehensive design/build or fabrication contracts with prime contractors who are responsible not only for building the exhibit units, but also for procuring all associated equipment and managing the interface with the building. While this transfer of coordination and risk to outside vendors may be comforting to museum management, there are clearly cost implications, and, more significantly, potential constraints on how green the result will be.

Green approaches to budgeting and contracting require more flexibility than the older red approaches. If we are to become serious about

Green approaches to budgeting and contracting require more flexibility than the older red approaches.

recycling materials, re-using an inventory of parts, changing only the scenario layers and taking advantage of local resources, then the nature of contracting and the traditional divisions of budgeting need to change in expectation as well as in practice, as green opportunities arise.

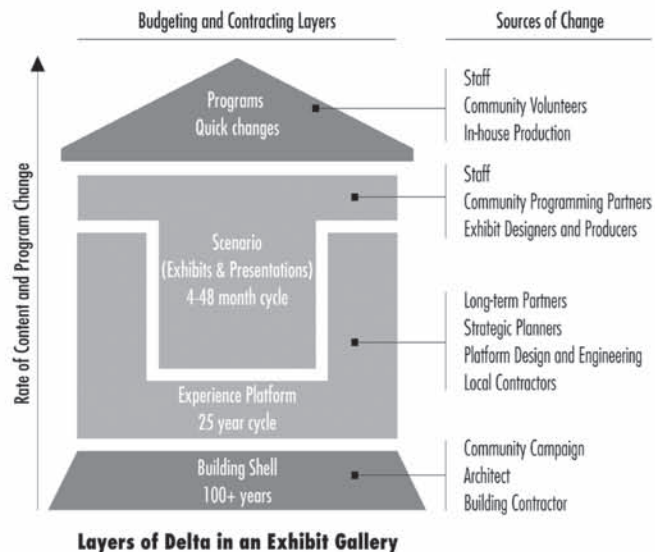
In one instance, we had bases and cabinetwork built locally, while the hands-on interactives were fabricated by national specialists. Yes, this process demanded more coordination and involved some risk, but that was offset by lower costs to the museum by sourcing the straightforward parts of the exhibition scope to local vendors, who were also motivated to do good work at a good price because of the local marketing and prestige benefits.

Designers and project managers will need to spend more time learning about what exists already, measuring and evaluating stuff to reuse, and sourcing locally. It means more unpredictable time by the designers out of the studio and into the storerooms and recycling yards. For museums with some Delta galleries, it means studying the capabilities of the built-in experience platforms and the existing kit of parts in order to creatively adapt those resources for an upcoming scenario installation. From the contracting perspective, the museum may want to divide the scope into more contracts in order to have better control over the choices of equipment that will be part of the museum's capital inventory and to make the best deals with local contractors, who can extend the museum's community partnerships. Delta museum approaches call for a new contracting division between the long-term experience platform and the changeable scenario layer, which should be budgeted and

even contracted separately, to make sure that each layer has its own physical and warranty integrity. With such separate contracts, when it comes time to install a second scenario, the old scenario should separate easily without compromising the workings of the experience platform. This too will require more design time for separate bid packages and more management time mitigating the interface risk, with the net result that the traditional budget split between soft costs and fabrication is likely to shift toward more planning and management time, with correspondingly less money spent on new fabrication.

The Case for Investment

“Upfront investment of about two percent typically yields life cycle savings of over ten times the investment...Research demonstrates significant and causal correlation between improvements in building comfort and



The diagram illustrates the separation between daily programs (top), the short-term scenario layer (mid-high), the longer-term investments in the experience platform (mid-low) and the base building (bottom); the frequency of change increases vertically. Courtesy of White Oak Associates, Inc.

Museums, already in the public eye as community service organizations, can play a significant role as green beacons for their communities....

(continued from page 11)

References:

- Brand, S. (1994). *How buildings learn: what happens after they're built*. New York: Viking Penguin.
- Brophy, S. and Wylie, E. (2008). *The green museum: A primer on environmental practice*. Lanham, MD: AltaMira Press.
- Elkington, J. (1994). Towards the sustainable corporation. Win-win-win business strategies for sustainable development. *California Management Review* 36, (2), 90-100.
- Katz, G. (2003). The costs and financial benefits of green building: A report to California's sustainable building task force [Electronic Version]. Retrieved December 2, 2008, from www.usgbc.org/docs/news/news477.pdf - 2003-10-15.
- Susanka, S. with Obolensky, K. (1998). *The not so big house: A blueprint for the way we really live*. Newtown, CT: The Taunton Press, Inc.
- West, R. M. (2004). The economics of interactivity. *Curator*, 47(2), 213-223.

control measures, and worker health and productivity,"(Katz, 2003) reports a study of green public school projects available on the US Green Building Council site. Of course museum projects are significantly different from schools, and no similar studies yet exist for green museums. Architects are starting to adopt new modeling software called Building Information Modeling (BIM), which allows fast calculations about the operating costs of potential design changes and system choices. Through BIM, more accurate energy modeling can be run on components of systems, like the energy consumption of a planned addition. Such data will support the case for fund raising.

It used to be hard to raise funds for HVAC and other building infrastructure, but now it may be easier if a project can be positioned as a green public demonstration with data that shows solid returns in reduced carbon footprint *and* operating costs.

Financing strategies for green museum projects open up new funding possibilities in addition to traditional sources. The list of governments that have embraced the green movement is growing, as mayors, governors, and our new president take on leadership responsibility for supporting and in some cases mandating green approaches to development and operations. Museums, already in the public eye as community service organizations, can play a significant role as green beacons for their communities. In this effort there are multiple opportunities to collaborate with government agencies, NGOs, academia, and business on green

public demonstration projects that leverage the museum's prestige, popular appeal, and trust to engage citizens in greening their world.

Networking with Other Green Professionals

Clearly, we have a lot to learn from each other, and we should work together to find innovations to green challenges. Numerous initiatives already exist among the museum profession's associations and websites. Some are program specific, like the Association of Science-Technology Center's International Action on Global Warming (IGLO) and the Madison Children's Museum's greenexhibits.org, while others are intended to bring museum professionals together and offer professional development focused on sustainable practice.

The AAM's Professional Interest Committee for Green Museums (PIC Green) is intended as the "Big Tent" where all museum professionals who are interested in green are welcome. Green strategies benefit from the wider perspectives that happen when art, science, history, children's, and nature museum professionals start collaborating on projects and networking with peers who are trying to reach the same kinds of goals. Just one year old, PIC Green has six working subcommittees, an educational program and a researched strategic plan for how this volunteer group of museum professionals can be most effective, while respecting all the other initiatives throughout the museum field. We encourage you, dear reader, to join us (<http://www.aam-us.org/aboutaam/councils/pic/index.cfm>). 