

## **Teaching Sustainable Development**

*By Barry Hersh*

### Introduction

This past December I was the last presenter on a panel about Applied Research speaking to colleagues from different fields at NYU. As soon as I mentioned teaching sustainable development, faculty in biology, law, engineering, statistics and more were all chiming in about how they were integrated sustainability in their classes. In 2007, Cornell University President David Skorton declared “sustainability is no longer an elective” - now sustainability is not only required, it is ubiquitous<sup>i</sup>.

Since sustainability involves so many disciplines where to place and coordinate it within an institution is always a challenge. In the past, much sustainability education focused on the preservation of natural resources and open space, often in planning, forestry and science programs. According to the Association for the Advancement of Sustainability in Higher Education (founded as a regional entity in 2001 and nationally in 2006), not only have educational programs expanded exponentially, there is a broader range of specialties including: public policy, natural systems, architecture, infrastructure, and most especially real estate, construction and land development<sup>ii</sup> The Association also notes that many universities now have non-curriculum sustainability related programs.

Consider a project to create a land trust to redevelop a blighted older neighborhood as urban agriculture, as is happening in the Midwest. That project could be taught as a brownfield real estate redevelopment, from a legal, tax or policy perspective, as ecological restoration, agriculture, or community planning. The task is to bring in all these viewpoints, within the discipline of the course.

### Focusing on Sustainable Land Development

Sustainability has become a key to how major institutions deal with their own properties and market themselves, but also for how real estate development is now taught. As real estate development returns (and it has started to) environmental responsibility is part of the agenda for projects both large and small. Some institutions have chosen to make sustainability their overarching academic goal, such as Bond University in Australia, which placed their entire architecture and development programs within an Institute of Sustainable Development and Architecture<sup>iii</sup>. Arizona State University has created a Global Institute of Sustainability with a “transdisciplinary” Sustainability Program<sup>iv</sup> Real Estate programs within business schools start from a different place but many have incorporated sustainability within their own course or encouraged coordination with design and environmental departments in their universities.

New York University has established a new Sustainable Development track within the Schack Institute of Real Estate, School of Continuing and Professional Studies, along with a new Center for Sustainable Development led by Dr. Constantine Kontokosta, PE, AICP, LEED AP. The new center works with NYU's many on-going sustainability offerings ranging from various degree programs in environmental science, to NYU-Poly engineering to an award winning non-curriculum University-wide Sustainability Task Force.

Teaching sustainable development starts with a concern for the limitations of natural resources, but also the perspective that there is both need and opportunity for new and improved projects<sup>v</sup>. It is important to provide an impartial framework of the best available scientific information about global warming, greenhouse gases, energy conservation and man's role – but please no more than one picture of a polar bear! Polemics don't provide real understanding of the context, and the real options for a built environment meeting human and ecological needs. Some of the popular gurus who provide the “big picture” from various disciplines, in a usable manner include William McDonough, Jeffrey Sachs, Amory Lovins and Thomas Friedman, and the media is full new sustainability related commentaries.

The idea of smart growth has been put forth for more than thirty-years – while Anthony Downs has noted most real estate development continued to be sprawl<sup>vi</sup>. A combination of economic and scientific concerns has brought environmentally responsible design and development to the forefront. For me and some others sustainable development focuses on land recycling (i.e. brownfields), intense growth near transit and other infrastructure and smart use of resources, a view most recently articulated by David Owens in Green Metropolis<sup>vii</sup>. Others, notably the US Green Building Council, begin by focusing more on buildings themselves; building green and then adding retrofitting existing structures and neighborhood development categories. Whatever the origins, incorporating environmental values are seismic shifts for real estate, design and construction education.

### Drivers for Change

Concern about global warming and greenhouse gases may be the key driver from an ecological perspective. There is also a spiritual element, being a good shepherd of the earth – now we can include the theology department. How to get to the “triple bottom line” is perhaps the ultimate goal of sustainability education

Future developers need to understand the multiple drivers for the new emphasis on sustainability. The market has played a key role, going green becoming a key component for an increasing proportion of new development as the economy recovers, with LEED being an enormously successful branding measure<sup>viii</sup>. Government at all levels has stepped in, from the HUD-EPA-DOT sustainability partnership announced June 2009<sup>ix</sup> and mass transit funding at the federal level, to California's numerous green efforts, to New York City's recently updated PlaNYC

2030 and recently passed green building legislation. The financial community, still recuperating from near collapse, has been more recalcitrant. While there are many real and alleged “green funds”, only a limited amount of specifically green private financing has been available for any development. Yet “high performance” the term real estate professionals seem to prefer, has been quietly incorporated in much of the conventional financing available for a major new projects, especially in the coastal gateway cities.

### Measurement

Making sound decisions towards environmentally responsible development means measuring performance. There has been a flurry of academic and practitioner studies of the economic costs and benefits of sustainable development, in particular of LEED buildings, including Muldavin, Quigley, Eichholtz, Kok, Yudelson, and others<sup>x</sup>. Interestingly, those who focus on the highly quantifiable data of energy performance include both the more hard-nosed of real estate professionals - and the equally adamant environmental advocates focused on greenhouse gas controls. In comparison there are those who look at the more complicated to delineate factors (e.g. isolating green effects from location, newness, management, etc); and their impact on occupancy, rental rates, non-energy operating costs, sale price; to the even more difficult analysis of measuring employee health and performance in relation to work environment. The short, easy answer is too soon to tell, but the preponderance of studies to date has shown that high performance buildings are significantly advantageous in terms of financial return. While the broader perspectives indicate a greater differential in favor of green developments (due mostly to tenant satisfaction expressed in higher occupancy and rental rates), energy savings performance alone often shows a positive return. The efficacy of specific design choices or retrofits can and have been analyzed, usually best on a case by case basis. While payback periods may be relatively short, the additional costs of a specific choice are limited by the ability to pay, or borrow, for that improvement.

Perhaps the best indicator of all is that despite some industry recalcitrance, developers strong enough to be proceeding, and their financiers, are focusing on green. From the retrofitting of the Empire State building where Anthony Malkin leads a team that includes the Clinton Climate Initiative, to Post Properties in Atlanta that has focused its business away from sprawl to infill development; active developers are clearly moving towards sustainability. Large portfolio owners, such as Real Estate Investment Trusts Vornado and Prologis, have added energy performance and other green features to their repertoire. Institutional owners, hospital and schools are going green as quickly as their finances allow. Certainly the success of a development firms such as Jonathan F.P. Rose and Associates, which works exclusively on green development projects, has been noted by both competitors and young job seekers.

## Complexity

Sustainability issues permeate a modern real estate development adding a whole layer of concerns. One key point is that environmental responsibility must be an intrinsic component from the start, especially in site selection. For major commercial buildings, while somewhat green is the new standard - identifying design and construction costs become a function of the level and costs of certification. Detailed energy modeling required for certification provides a better estimate of new construction energy costs, which then gets built into the operating budget. Estimating rental rates become a measure of any green premium. Perhaps the most challenging question now is if any positive value placed on a green building proposal by lenders is enough to help get a project financed. For certain, an environmentally responsible project faces an easier road seeking government approvals, and is all but mandatory for public-private developments.

Among the concerns in moving towards sustainable development is the sheer complexity involved. As an example, redeveloping formerly contaminated sites along America's waterways is a real estate, environmental, and community opportunity. But waterfront brownfield regeneration is extraordinarily complex; involving ecology, land use, community access, remediation, historic preservation, real estate economics, flood plains, urban design as well as real estate economics<sup>xi</sup>. Just one factor, if the water's edge includes wetlands, would involve five Federal plus several state agencies. There are court determined definitions of wetlands, and specific provisions to protect these fragile environments and the plants, birds, animals and microscopic benthic community that can only survive in wetlands.

Then add the complications of green building, possibly LEED certified. While incorporating green features may help overcome the stigma of a brownfield. As well as in the approval and the funding process – green still adds complication. From a developer's perspective each of the complications is represented on the financial pro forma; how long will the process take, how much will it cost, and will the requirements place too onerous a burden on the project. Then the project may be a public-private partnership, adding government concerns for waterfront amenities, remediation, affordable housing or economic development. The revitalization of waterfront brownfields fits nicely into the concept of multiagency sustainability partnership, but also means dealing with specific programs (i.e. Brownfields grants, tax credit programs) and specific requirements. Mastering such complexity, including being an astute customer of all the associated disciplines, is now part of the education of environmentally responsible developers.

Another concern is the tsunami of "green" information, much of it self-promotional "greenwash" that gets put forth every day. Measuring real performance, focusing upon the most important factors, calculating payback, and selecting the most effective materials and products are complicated and significant tasks. Real estate professionals also need to understand what marketing is valid and appropriate, and to be a discerning client of all those trying to sell their own "green" products and services. Determining what shade of green a project should be, and

understanding the real performance of their buildings in terms of energy and other environmental measures, are important lesson to learn.

## Conclusions

Just as one cannot create a sustainable development by adding green features to a conventional project, a sustainable development class must be built organically, integrating various disciplines from the start. As Chris Leinberger of the University of Michigan has noted, the 5,000 + square foot house, half an hour drive from anything, may be the “next slum” no longer a viable model - despite adding “green” features<sup>xii</sup>. An important lesson is about selecting projects that are intrinsically sustainable; what have been successful development strategies for more than a generation may not be effective in the new green economy?

Teaching sustainable development does include core skills, but is not limited to one discipline. Wherever a sustainable development course is placed within a school, but the array of input must be broad, whether brought in as additional reading, speakers, non-course events or coordination within other disciplines within the University. Teaching development now requires more than keeping up with current trends, but also the skills to deal with very complex systems, understanding performance and looking at both new and old concepts with a clear and discerning eye.

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<sup>i</sup> Skorton, David, February 23, 2007

<sup>ii</sup> American Association for the Advancement of Sustainability in Higher Education, Academic Programs related to Sustainability, 2010

<sup>iii</sup> Bond University, Institute of Sustainable Development and Architecture

<sup>iv</sup> Arizona State University, Global Institute of Sustainability

<sup>v</sup> Timpson, William M., Dunbar, Brian, Kimmel, Gailmarie, Bruvere, Brett, Vewman, Peter I, Mizia, Hillary, 147 Tips for Teaching Sustainability, Atwood Publishing, 2006

<sup>vi</sup> Downs, Anthony, Smart Growth, Why we Discuss it More than We Do It? Journal of the American Institute of Planners, Vol. 71 – 4, 2005

<sup>vii</sup> Owens, David, Green Metropolis, Penguin Press, New York, NY 2009

<sup>viii</sup> US Green Building Council, LEED Buildings Grow by 14% Despite Market Crash, November, 2010

<sup>ix</sup> HUD-EPA-DOT Partnership for Sustainable Communities, June, 2009.

<sup>x</sup> Eichholtz, Piet;Kok, Nils and Quigley, John M., Sustainability and Dynamics of Green Building, March 2010  
Muldavin, Scott, Green Building Finance Consortium  
Yudelson, Jerry, The Green Building Revolution

<sup>xi</sup> Hersh, Barry, The Complexity of Waterfront Brownfields, American Real Estate Society Conference, April, 2010

<sup>xii</sup> Leinberger, Christopher B, “The Next Slum”, the Atlantic, March 2008.