

Educating Urban Designers for Post Carbon Cities

Changing climate patterns and diminishing supplies of inexpensive oil require us to design our cities in radically different ways. Reducing energy usage and carbon emissions is necessary to limit global warming, address severe weather events and rising sea levels, and face the threats of reduction of food production, loss of biodiversity, and dependence on unreliable energy suppliers.

These problems are urgent, global and closely linked. Their convergence forces us as professionals concerned with building cities to rethink our basic premises, mission and vision.

The Challenge

1. We must engage in sustainable design at all scales from urban regions to neighborhoods to buildings and landscapes to the products we use for building and using cities.
2. We need to develop effective strategies for mitigation, adaptation and new sustainable construction, and master the obstacles to their implementation.
3. We must develop better means for ongoing measurement of the environmental performance of buildings, landscapes and urban areas.
4. We must acknowledge that while we are all sustained by the same atmosphere and natural resources, and draw upon the same supplies of energy, our responses to the current situation will vary greatly depending upon each society's level and pattern of development.
5. We, in societies with greater material resources will need to reduce carbon emissions and conserve energy aggressively to create room for the economic advancement of lower-resource societies. We, in less developed countries need to avoid the mistakes of over-reliance on energy from fossil fuels and excessive carbon emissions.

Fundamental Principles

6 No single design profession can address the issues of global warming and reduction of energy supplies. Instead, urban designers, architects, city planners, landscape architects, product designers, and engineers must work collaboratively to reformulate urban patterns. To this end we must

- integrate a fundamental concern for our natural environment into our instruction and practice,
- sponsor research that not only uncovers innovative approaches but also evaluates performance,
- promote collaborative practices, sharing of knowledge, and use of common language between our disciplines and other contributors, particularly ethnographers, ecologists, historians, environmental scientists, materials scientists, economists and entrepreneurs.

7. Urban design educators and practitioners need to expand their concerns to anticipate the local and global impacts of design decisions. In addition to environmental impacts, we need to be conscious of the needs and views of diverse populations, especially low-income groups in the Global South and North. To this end we must

- recognize that, in addition to current or paying clients, we have a responsibility to future inhabitants of the planet.
- pursue a mandate to make things green on a per capita basis,
- think systemically rather than solely in terms of projects.
- develop visions collaboratively and cross-culturally.

Urban Design Education

8. Students of all of the disciplines that shape the urban environment need to be educated about the imperatives of designing the post-carbon city. They also need to be prepared for a diverse set of roles that will include designer, advocate, critic, organizer, mediator, visionary and creative artist as conditions demand – to become full citizens of both their local communities and the globe.

9. The education for the new urban design professional should be organized around several purposes:

- developing an understanding of the political, philosophical and moral implications of the practice of shaping cities;
- cultivating the capacity to envision new urban patterns that embrace ecological complexity, economic sustainability and social justice, and recognizing that these are sometimes competing objectives;
- developing an understanding of the performance of sites' natural systems over time,
- allowing design studios to serve as crucibles for learning collaboration across disciplines and interaction with clients and citizens;
- continuing to develop the traditional skills of conceptualizing and rendering urbanization in all of its dimensions – the relationship between subdivision and land ownership; lots and blocks; building types; the regulatory regime; the infrastructure needed to support settlement; the form, design, activities and uses of public spaces; the visual and experienced character of places; and the development process.

10. Added to this core of knowledge, future urban designers will need to acquire new skills so that they are able to

- calculate ecological and carbon footprints at several levels – individual, building, neighborhood, city and region -- and distinguish those designs, urban forms, and every

day practices that minimize the footprints;

- estimate the space and facility requirements at several scales to generate and use energy from alternative sources, to recycle rain and waste water, to collect and re-use organic waste, and to grow food locally;
- converse knowledgeably with the technical experts on sustainable infrastructure systems, and to integrate these technologies and urban forms;
- understand environmental economics, including markets for alternative energy, the role of incentives and taxes in conservation, financing vehicles and other essentials that impact the ability to change behavior and development processes;
- design circulation systems, especially mass or shared transit, including systems for non-motorized vehicles and pedestrians of diverse abilities, understanding how the need for mobility is changing with new information and communication technologies;
- understand the economics and urban densities required to support and integrate alternative-fuel mass transit and vehicles;
- understand the complexity of density (including an understanding of cultural factors in prescribing density, the implication of different densities on infrastructure costs, and learning how to quickly estimate the densities of sketch designs) and design strategies for integrating higher densities into existing cities.
- formulate design guidelines, building codes, and zoning regulations that assure public health, promote transit access and walkability, reduce the use of and/or generate energy on-site, limit runoff, CO₂ and wastes, encourage use of local materials, and accomplish other sustainable development objectives,
- communicate effectively employing traditional graphic and verbal skills, supplemented with new video, sound, and voice technologies, integrated into multimedia presentations, and making projects readily available via the world wide web,
- identify and interact with diverse interests, mediate differences, and undertake negotiation and consensus building to reach agreement among different constituencies in the face of new global energy and climate challenges.

11. The new urban designer will need to feel comfortable operating under conditions of ambiguity, appreciating the fact that that the science and art of integrating sustainability into

urban design is an evolving challenge requiring the adaptation and advancement of ideas as they emerge,

12. Current working professionals also need to acquire quickly an understanding of the essentials of sustainable design. New part time degree and certificate programs, professional development courses, conferences, workshops and charrettes, should be offered to current practitioners to increase their capacity to employ holistic approaches to sustainable design and to learn the new skills in design curricula suggested here. Once informed about issues of urban sustainability and re-trained in the use of new media (print, film, video and the internet), design professionals will have the standing to engage communities, politicians, developers, scientists and economists and to lead the public discourse.

Expanding the Knowledge Base

14. There is a need for concrete knowledge on environmental performance, at a level of specificity that reduces the need for speculation. With thousands of experiments across the globe in constructing more sustainable communities, there is ample opportunity for measuring performance over time. These studies need to be compiled and made available to design professionals via the internet.

15. Every university educating urban designers ought to commit itself to contributing to this base of knowledge. Urban design education programs should also sponsor innovative research and methodological speculation that may not always have immediate application to current projects. This may involve ecological impact modeling that cuts across political and programmatic boundaries. It can involve developing speculative scenarios to compel citizens to become active participants in transforming their cities.

The ultimate agency for the urban designer is as someone who is able to describe potential futures for the city in visual, technical, and narrative terms that foster social involvement, political action, and economic investment to make reality the post-carbon city.

The foregoing agenda was the outcome of *Re-Imagining Cities: Urban Design After the Age of Oil*, an international symposium hosted by the University of Pennsylvania School of Design and Penn Institute for Urban Research, on November 6-9, 2008. The symposium, supported by the Rockefeller Foundation, commemorated the 50th Anniversary of the Penn-Rockefeller Conference on Urban Design Criticism. Over 300 urban design educators, policy experts, professionals, and students from around the world participated in the discussions that resulted in these recommendations.

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