

The Good City: Design for Sustainability

Abstract Today, we are faced with many problems to which designers can contribute solutions. Action can take place at three levels: the micro level, that of individual action; the meso level is the level of groups where the individual may still have some influence; and the macro level includes governments, international organizations, and large companies. At the outer limits of the meso level is the city, which is still potentially capable of adopting coherent policies for change. There are many good ideas about urban design although it is rare to find a city that has integrated a large number of them into a holistic system. What is called for is a systemic approach to these initiatives that will form the basis of a new theory of sustainable urban planning. Such a theory would take into account the following factors as well as others: 1) producing and distributing food; 2) recycling soft and hard waste; 3) providing shelter and eliminating homelessness; 4) microlending and stimulating cooperative businesses; and 5) providing alternative energy.

Keywords

Sustainable urban planning
Holistic system design
Meso level design

Received July 7, 2015

Accepted July 20, 2015

Published September 16, 2015

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The peer review process is the responsibility of Tongji University and Tongji University Press.

<http://www.journals.elsevier.com/she-ji-the-journal-of-design-economics-and-innovation>

<http://dx.doi.org/10.1016/j.sheji.2015.07.001>



Introduction

Design is undergoing a momentous change. Where designers were once known for creating the visual appearance of products, whether coffee pots or posters, today they are becoming recognized for their work on the design of services, organizations (including government agencies), and even social networks. Specializations such as interaction design, experience design, social design, and design for sustainability did not exist a few years ago. The older projects of designing artifacts have not disappeared but the recognition that design can be so much more is growing. The work of designers has even extended to cities, not as city planners or architects but as coordinators of projects to improve urban life.

Facing the Future

Today, we are faced with many problems to which designers can contribute solutions. In fact, designers are key to thinking about the future and how design might impact the problems we face not only today but also in the future. To imagine a future that is different from the present is to risk that the future we seek to bring about will be better than what we have. However, this is not an arbitrary process. We usually draw our ideas of the future from what we like best about the present. Of course, this suggests that everyone has his or her own preferred future but we know that a scenario of competing and even clashing futures is not possible. There are certainly numerous factors beyond anyone's personal desires that play an important role in the kind of future we should be seeking. First is the natural factor of climate change; then the social behavioral factors of resource consumption and waste elimination, and finally the social values factor of justice for everyone.

In 1972, the Club of Rome published *The Limits to Growth*, a study based on MIT computer models that simulated the relations between the earth's resources and the human population.¹ As a forecasting tool, *Limits to Growth* argued that the continued consumption of resources at the current rate was unsustainable. Its call for new sustainable environmental and social policies was continued in subsequent studies – the World Commission on Environment and Development's *Our Common Future*, a report directed by Norway's former Prime Minister, Gro Harlem Brundtland, and *Agenda 21: The Earth Summit Strategy to Save Our Planet*. Both originated within the United Nations system, the latter in conjunction with the Rio Earth Summit in 1992.² That conference was followed 20 years later by Rio+20, which produced its own set of documents, notably *The Future We Want*, which called for change.³

We can already see evidence that our consumption habits are severely affecting the climate and resulting in an increasing number of natural disasters. To respond to each of these disasters is a major effort that demands excessive human and material resources. Should they continue to increase there is a risk that we will be overwhelmed by them and will not be able to successfully respond when they occur. Therefore we have to drastically change the way we live, particularly the way we obtain and use energy. The more carbon dioxide we pump into the atmosphere from gas-powered vehicles, the more we contribute to an unhealthy and ultimately dangerous atmosphere. The more we consume resources excessively, the less there are that remain for successive generations. And the more waste and garbage we generate, the more we use up available land for it to be dumped and, as a result, the more we contaminate the soil. This is not to mention dumping chemical and toxic waste in our rivers and oceans, and overfishing our waters to deplete them of food for the future. I could continue with more descriptions of reckless behavior but clearly it is not necessary. Finally is the issue of social justice and the way resources are distributed. The disparity between those who are wealthy and those who are

1 Donella H. Meadows, *The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind* (New York: Universe Books, 1972).

2 World Commission on Environment and Development, *Our Common Future* (Oxford: Oxford University Press, 1987) and Daniel Sitarz, ed. *Agenda 21: The Earth Summit Strategy to Save Our Planet* (Boulder, Colo.: Earth Press, 1994).

3 *The Future We Want*, accessed July 1, 2015, http://www.un.org/disabilities/documents/rio20_outcome_document_complete.pdf.

4 Lester R. Brown, *Eco-Economy: Building an Economy for the Earth* (New York and London: Norton, 2001), 3.

5 See Victor Margolin, "The Liberation of Ethics," in *Ethics? Design?* ed. Clive Dilnot et al. [Archeworks Papers I no. 2] (Chicago: Archeworks, 2005), 160.

6 Victor Margolin, "The Citizen Designer," in *Looking Closer Five: Critical Writings on Graphic Design*, ed. Michael Bierut, William Drenttel, and Steven Heller, 118–128 (New York: Allworth Press, 2006). The term was previously used by Steven Heller as the title of an anthology in 2003.

not exists throughout the world. As the Universal Declaration of Human Rights clearly spelled out almost seventy years ago, each person has the right to shelter, food, education, and opportunities for development.

The problems are evident but the solutions are not. Nonetheless, myriad authors in recent years have produced future scenarios based on their beliefs that sound environmental policies are crucial to humankind's survival. In his book *Eco-Economy: Building an Economy for the Earth*, Lester Brown stated that "[e]conomists see the environment as a subset of the economy. Ecologists, on the other hand, see the economy as a subset of the environment."⁴ The environmentalists provide cogent arguments for change and have consequently made impressive inroads into the policies and practices of individual nations and civil society organizations. Sustainability, which denotes both environmental and social well being, is also on the international agenda as an integral component of United Nations policy, notably in the existing Millennium Development Goals and the future Millennium Development Goals for global sustainability.

Paradoxically, designers united as a professional class could also be inordinately powerful in creating visions of the future. As creators of models, prototypes, and propositions, designers occupy a dialectical space between the world that is and the world that could be. Informed by the past and the present, their activity is oriented towards the future. They operate in situations that call for interventions and they have the unique ability to turn these interventions into material and immaterial forms.

Trained in many disciplines – whether product design, architecture, engineering, visual communication, or software development – designers are responsible for the artifacts, systems, and environments that make up the social world – bridges, buildings, the Internet, transportation, advertising, clothing, and construction equipment, to cite only a few examples. Companies would have nothing to manufacture without designers nor would they have services to offer.

At the core of a new design, ethics is the question of what it means to be human. I prefer to situate the human environment as Tomás Maldonado does within a larger system that transcends the limits of human production.⁵ Maldonado notes that human agency is capable of damaging or destroying the larger system but that the human environment is no more than a subsystem of the ecological one. The implication of his schema is that the conduct of human life is in some way accountable to the complex order of the larger environmental system. Modeling the organization of the human environment on the biosphere is problematic but, as numerous scholars have shown, there is nonetheless much that humans have to learn about co-existing with nature.

The Citizen Designer

Some years ago I adopted the concept of the "citizen designer," which I intended to signify that the designer has multiple roles, each of which has its own political/social dimension and consequences.⁶ I would like to discuss these roles within what I call an "action matrix." First, the designer makes products, or else devises propositions for making products. By a product I do not only mean a tangible thing, but also things that are intangible like services, policies, and large complex environments. One of the new and positive directions in design research today is the movement of design thinking into areas where it did not exist before.

Second, the designer participates in the discourse of his or her profession. Every profession has its discourse, which includes the assumptions, procedures, and policies that guide the field's engagement with the world. Discourse also includes the conversations, websites, and proposals that are generated within the

field – policy documents, organization charters, manifestos, research, and publications.

And third, designers are ordinary citizens who need to participate in the social processes outside their professions.

Another aspect of the action matrix is the issue of scale. Action takes place at three levels: the micro level, which is that of individual action. Here we place issues of individual carbon footprints, decisions to recycle, ride a bicycle, control consumption, and so forth. The meso level is the level of groups where the individual may still have some influence. This involves organizations and social networks, as well as institutions such as art schools and universities. The meso level mediates between the individual and the macro level, where it becomes difficult if not impossible to control outcomes. Perhaps the best example of the meso level is the city which, however large, is still of a scale to enable decisions that affect urban dwellers. The macro level would include governments, international organizations, and large companies with thousands or even millions of employees.

At all these levels, there is a search for visions, many of which compete with each other. The best ideas do not always prevail and consequently crises ensue. For designers, there are many possibilities to act at the micro level, both for one's self and in association with a few others – a life partner, a business partner, a friend. At the meso level, there are art and design schools, professional associations, and so forth. How exciting it would be if a design school adopted an across the board policy of training students to work in a world of environmental and social sustainability and organized itself around that goal.

At the outer limits of the meso level, I would put the city, which, though large, is still potentially capable of adopting coherent and effective policies for change. In fact, I would suggest that the city, rather than the individual artifact is the most effective site of utopian vision for the current moment. In the concluding section of this paper, I would like to return to the city as a significant site of action for the creation of a sustainable future. At the macro level, we see the greatest failures: the inability of the Copenhagen meeting in December 2009 to adopt a strong policy to combat climate change; the inability of governments to regulate large energy companies, thus resulting in environmental disasters such as the BP Gulf oil spill, and the difficulty of creating positive dialogue among the disparate groups that should result in new international laws and regulations that would help to alleviate the numerous environmental problems we face.

Urban Possibilities

In the preceding part of this paper, I made three points. First, the design professions are changing and designers are taking up new challenges that are very different from those of the past. In fact, we currently have no set definition of what a designer is or what he or she does. That's why the term "design thinking" seems to be so popular at the present moment. It suggests that there is a designerly way of looking at situations but it avoids a precise definition of what those situations are. Second, I made the point that design training enables designers to imagine possibilities for the future in ways that others are not likely to do. And third, I have laid out some of the myriad problems that we face as a species and have claimed that designers may have some ways to think about those problems that will provide better or at least different solutions than those we have now.

I would like to reinforce the idea that the meso level is one where many positive actions are possible. I am thinking in particular of the city since those who manage cities are obligated to relate directly to their inhabitants to insure that they have the required services. Of course, this does not always work. However, city



Figure 1 Curitiba. Copyright © 2015 Museum of the City.

leaders are still accountable for basic services such as housing, education, and access to food and health care.

I am optimistic when I consider the city as a site of change because I am aware of so many good ideas about urban design that are already in place around the world, although it is rare to find a city that has integrated a large number of them into a system that works holistically. As one example, however, I would mention the city of Curitiba in Brazil, which I had a chance to visit in 1992 and which has advanced considerably since (fig. 1).

In Curitiba, the former mayor, Jaime Lerner, an architect, established an Institute for Research

in Urban Planning to identify problems within the city that designers, whatever their field of expertise, could address. The case of Curitiba shows what can happen when a designer gains political power. Lerner's broad mandate enabled Curitiba's design staff to invent projects in response to discovered needs. Many different concerns were addressed from adding street signs in Braille text to creating innovative bus shelters that offered protection against bad weather, while also speeding up the boarding process. A special system of bus routes was worked out so that color-coded express buses could take riders to distant destinations while local buses circulated within the city center.

Recycling was a high priority for Curitiba and the Institute for Research in Urban Planning initiated a number of efforts that ranged from using recycled plastic containers for urban structures such as market stalls to starting a factory that converted used plastic materials into toys for Curitiba's school children. Old buses were transformed into information kiosks and downtown daycare centers where people could leave their children while they shopped. Wooden carts were provided for scavengers to go around the city and gather materials, which they could sell, and special mobile stalls were created for vendors in the city's various market places. Underlying these projects was the idea of integrated service. The designs arose from an investigation of needs and were implemented in such a way as to locate individual projects within a larger vision of urban planning.

I would like to use Curitiba as a point of departure to talk about other ideas for what I will call The Good City. I introduced that term to a group of designers and architects in Chicago who were looking for a framework to use as the basis for creating changes in the city's infrastructure. After a couple of years, the work of this group has resulted in several proposals to encourage urban walking and bicycle riding. I have also produced the first draft of a document called The Citizen's Plan for Chicago, which I want to use for forthcoming discussions about how to make Chicago a truly sustainable city. I use the term "Citizen's Plan" as a contrast to the typical urban plan, which is drawn up by professional planners. In my vision, the Citizen's Plan will not only generate ideas from a wide range of citizens but it may also identify opportunities for citizens to participate in turning good ideas into enterprises. Many of the ideas I have considered are already in place in cities around the world. However, I want to argue that despite all the initiatives that are focused on single projects, what is called for is a systemic approach to these initiatives that will form the basis of a new theory of sustainable urban planning. Such a theory would take into account the following representative factors as well as others: 1) producing and distributing food; 2) recycling soft and hard waste; 3) providing shelter and eliminating homelessness; 4) microlending and stimulating cooperative businesses; and 5) providing alternative energy.

Growing Food

As already mentioned, the urban garden movement has now become widespread. It is an excellent way to cultivate otherwise unused urban land, insure the local production of food, contribute to forming a community because the food is grown locally, and provide jobs for urban farmers. In Chicago, we have a large number of urban gardens, some of which also make use of compost that is derived from food waste (fig. 2). Perhaps the principal urban farmer in Chicago, Ken Dunn, has always worked with an integrated vision that included creating jobs, growing food, and collecting and recycling food waste.



Distributing Food

Street food is sold in many different ways. I have been fascinated with the adaptation of bicycles and motor scooters as vehicles for selling raw and prepared foods (fig. 3). In China, portable food markets and restaurants on bicycles are everywhere. These vehicles are usually designed by their owners on the basis of a bicycle frame that includes a bin for transporting goods. In the United States, food trucks circulate in cities to sell many kinds of food. These trucks are fitted out with kitchens for preparing food. Often they are owned by restaurants that provide another outlet for their customers.



Urban Composting

Of course, the other side of producing and distributing food is getting rid of food waste. In the United States, there is a growing movement to save food waste and turn it into compost for gardening and farming. I am calling this form of waste “soft waste” to distinguish it from “hard waste” which consists of durable materials like cardboard, metal, and plastic.

Until recently, recycling soft waste or composting was difficult because there were no services to pick up food waste from individuals, markets, or restaurants and take it to a center where it could be turned into a product to enrich the soil or else turned into energy. Now such enterprises are beginning and they will likely expand to serve a growing market of people, restaurants, and stores who will pay to have their food waste taken away. The waste is then taken to sites where the waste haulers pay to dump it on compost heaps or put it in large machines that that decompose the waste and turn it into energy. One area for growth in the new food waste hauling industry is the design of vehicles – especially bicycles with storage racks – that can be used for waste hauling instead of energy-consuming cars or trucks (fig. 4). Another is the design of decomposing machines that can convert compost to various forms from material for soil enrichment to energy and liquid.



Figure 2 (Top) An urban farm in Chicago.

Figure 3 (Middle) Chinese restaurant bicycle. Photo: Victor Margolin.

Figure 4 (Bottom) Bicycle for hauling compost.



Hard Waste

Hard waste is material such as plastics, cardboard, and metals. This waste is generally disposed of in different ways. In the United States, it is taken away by large waste haulers who separate it and then sell it. The waste haulers normally do not take electronic equipment or household appliances. Chicago has a recycling center for such equipment and it hires people to take it in, organize it, and then prepare it for sale to companies that extract from it the metals and other reusable materials.

People are willing to recycle but few people understand the economics of recycling – where the materials go, how they are separated, how they are sold, and how they are converted into new products (fig. 5). There is much to think about in the design of this recycling process. How can it be done at a large urban scale and how can it be done at a smaller scale where individuals and small businesses can participate in the process of sorting and selling hard waste as well as turning it into new products such as recycled paper and packaging material. Just as we think of food cycles, we should think of materials cycles. In Germany, many manufacturers are obliged to take back used products and dispose of them or handle their recycling themselves.

Low cost methods of recycling include collecting metal soda cans or cardboard sheets. Such activities are often done by single individuals who collect cans or



Figure 5 (Above) Recycling bins.

Figure 6 (Below) Collecting cardboard. Photo: Victor Margolin.

cardboard and take them to a recycling center where they receive some payment (fig. 6). But there are also cooperative enterprises that have grown up around such recycling. Brazil has been a leader in the creation of recycling cooperatives where everyone shares in the profit of selling the recycled materials. Such enterprises require varied skills from finding the recycled material to packaging it, selling it, keeping accounts, and so forth. It is simply one of many enterprises that can grow from what I call the “waste economy,” which produces an abundance of surplus soft and hard waste that is available for collection and conversion. Such co-operatives have the capacity to grow into thriving businesses but they must be successfully planned and managed.

Repairing and Recycling Products

Many products are prematurely converted to hard waste although with adequate repair or recycling they could remain in use. I think particularly of some home appliances and bicycles. Many small appliances are thrown away because the cost of fixing them may be as much as buying new ones. However, there is also the cost of disposing of the old appliances and that is usually pushed onto the municipality. The excess of such appliances results in large landfills, either in the city where they are thrown out or in some other city that is paid to take the garbage. Thus, there is an incentive to reduce landfills by maintaining products rather than throwing them out.

There are systems that can be set up to repair appliances and other products such as televisions and computers. In Cuba, there is a system for repairing products. Much of the work is done in kiosks that are located in public places (fig. 7). I



am aware of the *relojeros* who repair watches and recall an incident when I was in Havana some years ago where the frame for my eyeglasses broke and I was able to take it to a repairperson on the street who fixed it. Repairing products is almost a lost art in the United States but it is an important and viable activity that can do much to keep products out of the landfills.

One successful repair enterprise in Chicago is Working Bikes, an organization that accepts old bicycles that are donated. These bicycles are then repaired and many are sold for a modest price (fig. 8). Others are packed in shipping containers and sent abroad, particularly to Africa, where they are donated to organizations that distribute them to individuals. The recycling of bicycles is closely related to the rental of bicycles, which has become common in cities around the world. The availability of rental bicycles for a modest cost has fueled the creation of bicycle lanes and encouraged greater bicycle use, which cuts down on transport by car, taxi, or bus.

Homelessness

In one American city, Phoenix, Arizona, the mayor was able to effectively eliminate homelessness for all veterans by finding low cost housing for them (fig. 9). There is a great need for buildings with small rooms and low rent. These are called Single Room Occupancy buildings or SROs. Without such inexpensive housing it is very difficult to provide shelter for homeless people. There are, of course, temporary structures and these are better than nothing (fig. 10). Such structures, as Shigeru Ban, has shown, can be built inexpensively from cardboard. They are acceptable as

Figure 7 (Upper left) Relojero.

Figure 8 (Upper right) Working Bikes Cooperative, Chicago.

Figure 9 (Bottom left) Rehoused formerly homeless veterans.

Figure 10 (Bottom right) Cardboard homeless shelter.



Figure 11 (Top) Solar panel house. Copyright © 2015 Eco Alternative Energy.

Figure 12 (Middle) The Plant. Photo: Victor Margolin.

Figure 13 (Bottom) Anaerobic digester. Photo: Victor Margolin.

temporary solutions but not for the long term. A different kind of project to address homelessness is to weave sleeping mats out of recycled plastic bags. While this does not get homeless people off the street, it does provide a better sleeping surface than the slabs of cardboard that are frequently used.

Microlending

The success of the Grameen Bank in Bangladesh and its adoption in many parts of the world has shown that microlending can be a valuable resource for people who want to start businesses with very small amounts of capital. What Muhammad Yunus, founder of the Grameen Bank, showed is that there was room for new institutions that could do what ordinary banks were not designed to do; that is, provide smaller amounts of capital than it would be worth the while of a regular bank to do. Microlending has made many small enterprises possible. It has also been exploited, unfortunately, by entrepreneurs who try to cheat lenders by charging unfairly high interest for the sums they lend.

Alternative Energy

The need to shift from fossil fuels to alternative energy sources is beyond dispute. The question is how to do it at a reasonable price. Until now, the conversion process has been taking place in a piecemeal fashion. On the macro side, there are large solar and wind farms that generate energy for sale. On the micro side, there are solar panels that can be installed on individual homes (fig. 11). In between are alternative energy systems for office buildings but not much for public use at the city scale. One task for designers is to consider the different possibilities for alternative energy use in cities. What kind of equipment is needed and how can it be financed? Should municipalities participate in helping citizens reduce their personal energy consumption? It is, of course, in the best interest of a municipality to do so.

System Design

I would like to conclude this brief survey of sustainable urban design possibilities by citing a project in Chicago, The Plant, which was started by John Edel, an industrial designer who was actually a student at the University of Illinois, Chicago, where I taught. Chicago has for sale some large buildings that were formerly factories where cattle were slaughtered and turned into meat products. Edel was able to buy one of these buildings at a low cost and is now turning it into an incubator for food-producing enterprises that are striving to become sustainable businesses (fig. 12). The food waste from these enterprises is being processed in a machine called an anaerobic digester that can create biogas for the building's renewable energy system (fig. 13). The aim is to gather new enterprises and incorporate them into a closed system of energy production and consumption that can eliminate any

reliance on fossil fuels. At present, there are several fish farms, a farm for mushrooms, and a bakery. Now a brewery is moving in. The Plant's staff are looking for other enterprises that can become part of a single system of energy and waste circulation.

Conclusion

I end this paper with a description of The Plant because the project demonstrates on a modest scale, how integrated systems could work on the larger scale to create a sustainable city. In any city, there are already activities that could become part of a sustainable system. Such a system could provide goods, services, and jobs for many people while also serving many valuable ecological functions: notably drastically recycling soft and hard waste, reducing landfills, addressing problems of homelessness, creating jobs, and using alternative energy efficiently. To create such a system or systems is a challenging problem for designers. It is not the kind of problem that they have historically addressed but it is certainly one that they are able to engage with now in order to help restore and preserve the health of our planet. The real challenge is to convince city managers, mayors, or officials of municipal administrations that such systems are beneficial. The tendency today is towards smart systems, high technology, and big data analyses. What I am proposing are bottom up projects that could become major contributors to improving life in urban areas. One of the challenges is to connect the many projects that are currently operating and forge systemic relationships that could benefit those already active in the sustainable city movement.