



Integrating Nature Into the Built Environment - Impressive Practice and Resources

The Challenge of integrating nature into our buildings and cities has been forever changed by the [biophilia hypothesis](#). Such integration would nurture that elusive and shy direct connection to our essential human nature. We dearly need that connection on a daily basis for our development and on-going well being. A Biophilic approach also creates a package of lower-order but more tangible value, such as habitat and biodiversity enhancement, ecosystem functioning, lower cost ecosystem services, recreation, community development. Ultimately, this integrative approach creates the higher quality places (buildings, blocks, districts, cities, regions) now desired by residents, businesses, and municipalities.

The Practice. The leading practitioners and communities have been wrestling with how to respond effectively for the past decade, or more (for example, ILFI, EcoDistrict.org, and Singapore). It is a work in progress that is being informed by a creative cross-pollination of the planning and design professions. At the heart of this innovation is understanding and using the principles of nature—our regenerative, self-organizing, complex, living system. This innovation will forge a new body of knowledge and practice from a synthesis across the disciplines of restoration ecology, urban design, landscape architecture, architecture, urban planning, and ecological urbanism.

Singapore—A City in a Garden. For more than 50 years, Singapore has been on a long slow path of creating a “City in a Garden.” As a result, they are a leading practitioner with many lessons and resources for the rest of us. Singapore has more than 2 million trees along roadsides, in parks and nature reserves. To achieve its “City in a Garden” vision, various greening policies have been pursued over the past five decades. These policies ensure trees are being planted along streets and within development sites. They also protect and conserve trees within development sites and in designated areas of the city with mature trees. Beyond tree planting and conservation, the City also recognizes the importance of green recreational spaces, which not only contribute to the expansion of the urban forest, but also serve as important community spaces and rich biodiversity sites. More recently, other exciting initiatives have also been developed to create habitat in less traditional “spaces” of the built environment. They promote roof gardens, vertical green walls and mid-level gardens. Together, these policies, schemes, and incentives help to create a city with close to 50% *green cover*. The various policies have helped Singapore grow into a “City in a Garden.”

Resources on Singapore include the following:

- Parks and Tree Act - <http://statutes.agc.gov.sg/aol/search/display/view.w3p;query=DocId%3Ac6871e24-cb16-417e-8dd5-81bdd6c1ff3c%20Depth%3A0%20Status%3Ainforce;rec=0>
- Development Guidelines - https://www.nparks.gov.sg/~/_media/nparks-real-content/partner-us/developers-architects-and-engineers/development-plan-submission-requirements/handbook_12-



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- Nature Ways - <https://www.nparks.gov.sg/gardens-parks-and-nature/nature-ways>
- LUSH Program - <http://www.ura.gov.sg/uol/circulars/2014/jun/dc14-lush20.aspx>
- Green Mark Certification - http://www.bca.gov.sg/greenmark/green_mark_buildings.html
- LEAF Certification - <https://www.nparks.gov.sg/partner-us/landscape-industry/leaf>
- LEAF Certification Award Winners 2014 - https://www.nparks.gov.sg/~media/nparks-real-content/news/leaf2014factsheetaldevelopmentsupdated_14oct.ashx?la=en
- Green Roof Guidelines - <https://www.skyrisegreenery.com/index.php/home/research>

“Super” Green Buildings. In addition, the leading edge of green buildings are often aptly characterized as **super green high rises**. The following are three inspiring examples.

- <http://architizer.com/projects/jardin/media/1058792/>
- <http://awards.ctbuh.org/media/ctbuh-announces-2015-urban-habitat-award-winner/>
- <http://capitagreensingapore.com/about-capitagreen/>

Two other examples of noteworthy buildings are the award-winning Bosco residential tower in Italy and the Commerzbank building in Frankfurt. The latter building has a series of nine 4-storey sky gardens spiraling up the building that are integrated with the natural ventilation scheme. It's been operating for almost 20 years now, so should also be a good source of lessons learned.

- Good images of the Commerzbank gardens. https://www.commerzbank.de/en/hauptnavigation/presse/mediathek/bilddaten/buildings/buildings_1.html
- A detailed case study of the Commerzbank. <http://www.mbenkert.com/arend.benkert.defilippis.tillmaand.pdf>
- Another Singapore example: <http://perkinswill.com/work/create.html>

The Big Challenge of this emerging theory/practice area is going beyond the aesthetics of ornamental landscape on a big scale, often vertically. That will involve not replicating nature in all its complexity, but creating a simpler “constructed” nature in the built environment of the city-region. What part of that larger, necessarily simpler, constructed habitat will this new “nature” play in the class A office buildings?

This new practice area will not forsake ornamental landscape, but extend it and modify it in a variety of ways. Obviously, it will need to be rooted in “native” plants of the city and its historical ecology, but with an eye to what can work in a city, and a city of the future under climate change, increasingly scarce resources/high demand, equity, even to the point of what role does the nature-in-building play in a 21st century regenerative city. These questions will be addressed in practice over time. The young research area of biophilia



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hypothesis, the young practice area of biophilic design, and the budding area of biophilic city planning and design are systematically embracing the challenge and advancing practice. Some resources follow from Professor Timothy Beatley's international research project on biophilic cities that lead to the launch of the Biophilic Cities Network.

- **Biophilic Cities Network (BCN) Home Page:** <http://biophiliccities.org/>
- **Stephen Kellert Yale Bio:** <https://environment.yale.edu/profile/kellert/> (I actually talked a bit to Stephen and just read his recent book, Birthright—People in Nature in the Modern World, which is exceptional (link to NPR interview here: <http://www.npr.org/2013/01/20/169523283/connecting-with-nature-to-reclaim-our-natural-birthright>)
- **Recording of Kellert's Keynote to the Biophilic Cities network Launch Event:** <http://biophiliccities.org/launch/> (includes link of Jennifer Wolch's also)
- **BCN Singapore Profile, including link to the film on BioP Singapore:** <http://biophiliccities.org/what-are-biophilic-cities/singapore/>
- **Film links:** <http://biophiliccities.org/films/>
 - **Biophilic Design - Architecture for Life** (also their site: <http://www.biophilicdesign.net/>)
 - Others . . . see list at the URL
- **You might like these links to Terrapin too (See "About Terrapin" below):**
 - All reports: <http://www.terrapinbrightgreen.com/publications/>
 - 14 Patterns of Biophilic Design: <http://www.terrapinbrightgreen.com/report/14-patterns/>
 - The Economics of Biophilia: <http://www.terrapinbrightgreen.com/report/economics-of-biophilia/>

About Terrapin. Focusing on transformative action for society, Terrapin utilizes whole-systems thinking to develop integrated design strategies, Terrapin challenges design and ownership teams to create restorative, regenerative environments. Terrapin believes in finding solutions that reconnect people with nature and mimic natural systems as this focus offers boundless opportunities to improve the quality of life for all. They also believe that high performance design means fundamentally improving health and productivity, while improving overall economic and environmental performance.

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