

NASHVILLE CIVIC DESIGN CENTER

Case Study: Center for Sustainability Education

Avenue of the Sciences

Helping fulfill Mayor Dean's promise of making Nashville the "Greenest City in the South," the Design Center proposes the establishment of a corridor devoted to science education and sustainable development along 6th Ave S from the proposed Convention Center to the Adventure Science Center, ultimately becoming known as the "Avenue of the Sciences."

In conceiving a new "Avenue of the Sciences" we perceive 6th Ave S as a model for education of environmental sustainability through programmed spaces, exhibitions and activities as well as through built structures that act as models of green building design. For example, a certified LEED Platinum Center for Sustainability Education with green roof technology, an energy generation area, and water collection areas for irrigation and grey water recirculation.

Potential elements along the "Avenue of the Sciences" include the following:

- Center for Sustainability Education
- NES educational substation
- Solar-powered battery charging facility for electric vehicles
- Partnerships with NES, TVA, local universities (e.g., Lipscomb University's Institute for Sustainable Practice), and a new elementary school
- Park and green spaces
- "Science Circuit" that guides visitors among elements along the avenue, reinforcing the interdependent forces that affect and define sustainability

It is the vision that such an Avenue would foster the development of sustainable and environmentally and socially conscious enterprises, creating jobs and a new sector of Nashville's downtown economy.

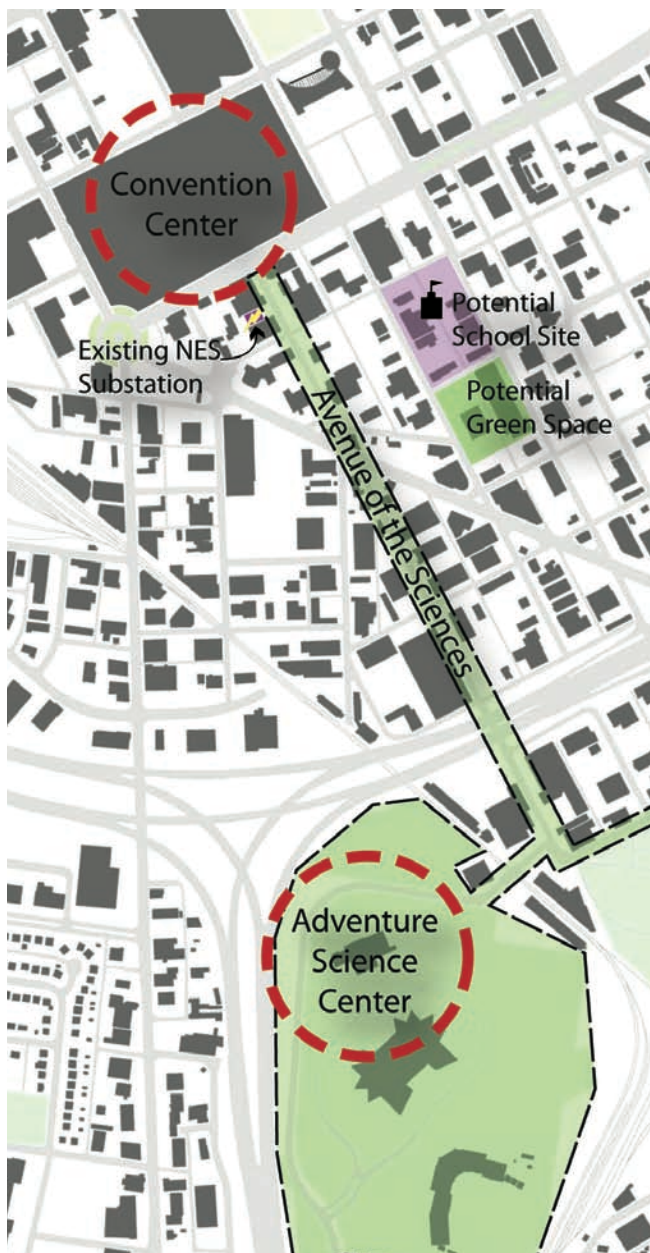


Figure 1. Schematic map of the "Avenue of the Sciences" along 6th Ave S depicting the Convention Center at the north end and the Adventure Science Center at the south end. Either of two existing NES substation could be modified to become educational facilities. (Diagram over map, 2009; NCDC, Matthew Gonsler)

Science Campus

The opportunity exists to expand this vision past the Adventure Science Center to the existing State Fair Grounds. With access via arterial roads, interstates, public transportation, and rail, the fair grounds site could be redeveloped into an urban science park, stimulating the economy and creating green jobs.



Figure 2. Schematic map of an expanded science corridor connecting the “Avenue of the Sciences” to the State Fair Grounds, which has the potential to be developed into a science-based industrial campus. (Diagram over map, 2009; NCDC, Matthew Gonser)

Center for Sustainability Education

As recommended by the Green Ribbon Committee on Environmental Sustainability in a 2009 report to Mayor Dean Metro should create a Center for Sustainability Education (in the report it is named the Green Building Design Center) as a public/private partnership that would showcase and provide education on green building practices.

As a keystone element of the “Avenue of the Sciences,” this public/private partnership could include the U.S. Green Building Council (USGBC), the Nashville Civic Design Center, and other related non-profit organizations. The Center will serve to showcase green building products, educate building owners, contractors, developers, architects and the public on new technologies and building methods. The Center will offer free technological assistance, green building guidelines and public promotion for qualified projects.

In addition, the program for the Center will contain the following:

- Theater/auditorium space
- Gallery/interactive educational space
- Flex space
- Library
- Meeting rooms
- Conference rooms
- Offices
- Services areas
- Outdoor demonstration spaces

In researching the idea of a Center for Sustainability Education, it was found that the most similarly conceived entities fall within one of the following categories:

- Research centers or institutes affiliated with a university.
- Rural/suburban-located organizations with ample land area and a focus on youth education and research.
- Science museums or centers with permanent and rotating exhibits with a focus on hands-on youth education and programs (such as the Adventure Science Center).
- Organizations that help build the social capacity and effectiveness of other organizations by providing meeting/office space, research and funding resources, and an in-house social network of similar interest groups.

However, there exists a prominent example of a center as conceived under the program described above, the Chicago Center for Green Technology.

Chicago Center for Green Technology

Chicago, Illinois
<http://cityofchicago.org>

- *Primary Focus:* house organizations and businesses committed to the environment by providing environmental products and services; educate about green building systems, environmental and economical benefits of such practices, and how to incorporate environmentally friendly, cost saving features into homes or businesses.
- *Site Details:* 17-acre urban site, renovation of a 40,000 sq.ft. 2-story building, certified LEED Platinum; building/site features include solar panels, rainwater collection for irrigation, recycled building materials, smart lighting, a green roof, and a geothermal exchange system; building houses the Green Building Resources center, which offers green building refer-

ence materials, product samples and technical assistance to the general public.

- **Organization Details:** municipal building owned by the City of Chicago's Department of Environment occupied a department satellite office, a solar panel production company, and a community gardening and job-training program; visitations are permitted.
- **Vision:** Helping professionals and homeowners learn how green technology is cost-effective and good for the environment and people.



Figure 3. View of the Chicago Center for Green Technology.

We envision a center of equal standards, which, like Chicago's center, will act as a model of design and education.

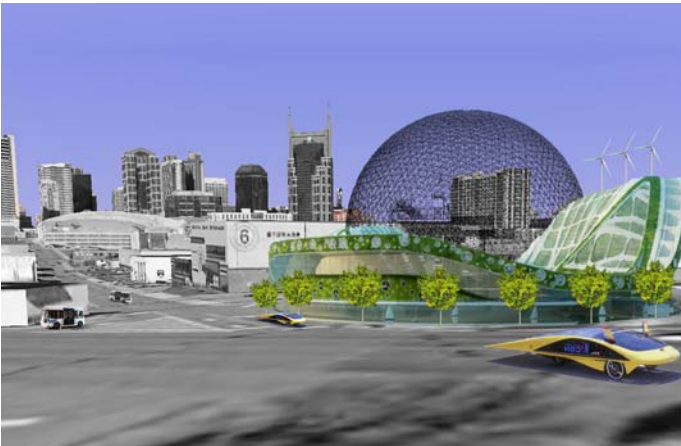


Figure 4. Conceptual rendering of a Center for Sustainability Education at the corner of Lafayette Ave and 6th Ave S. The site and architecture should be iconic and of the highest environmental standards. (Drawing, 2009; NCDC, Matthew Gonser)

Other Examples:

Urban Science Campus

Traditionally the idea of a "Science Park" takes the form of an industrial park on the urban/suburban edge, such as Metro Center north of downtown Nashville.

There are few examples of such centers within the urban core. One such example, however, exists in Philadelphia, Pennsylvania: University City Science Center.

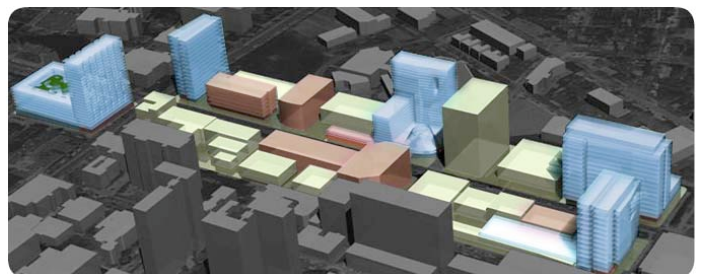
University City Science Center

Philadelphia, PA
www.sciencecenter.org

- Established in 1963 as a fully independent non-profit 501(c)3 organization.
- Located in the heart of Philadelphia's University City, adjacent to the University of Pennsylvania, Drexel University, Wistar Institute, The Children's Hospital of Philadelphia, and the University of the Sciences Philadelphia.
- 17-acre, 15-building campus specializing in providing wet and dry laboratory facilities, turnkey management services, and industry expertise to life science and technology companies.
- Over 2 millions square feet of wet labs, office, and retail space.
- Over 100 companies reside in the Science Center facilities employing approximately 7,500 people.



Figures 5 & 6. View looking east along Market St with University City Science Center in the foreground and downtown Philadelphia in the background. 3-D model of the Science Center showing affiliated buildings (blue and red) within the existing urban fabric.



Rural/Suburban Centers

Lloyd Center for the Environment

Dartmouth, MA

<http://www.lloydcenter.org>

- **Primary Focus:** coastal and watershed environments; students and teachers K-8; research; biodiversity and long-term conservation (watersheds, rare species and threatened habitats).
- **Site Details:** 55-acres of estuary and maritime forest; 5 miles of hiking trails; main building, 4-story former residence.
- **Organization Details:** non-profit 501(c)3 organization, supported entirely through program service fees, grants, and the voluntary contributions "of caring and concerned citizens, corporations and foundations."
- **Mission Statement:** The Lloyd Center's mission is to facilitate long-term conservation of our natural resources through education and research - and to inspire and empower citizens to make wise environmental choices.

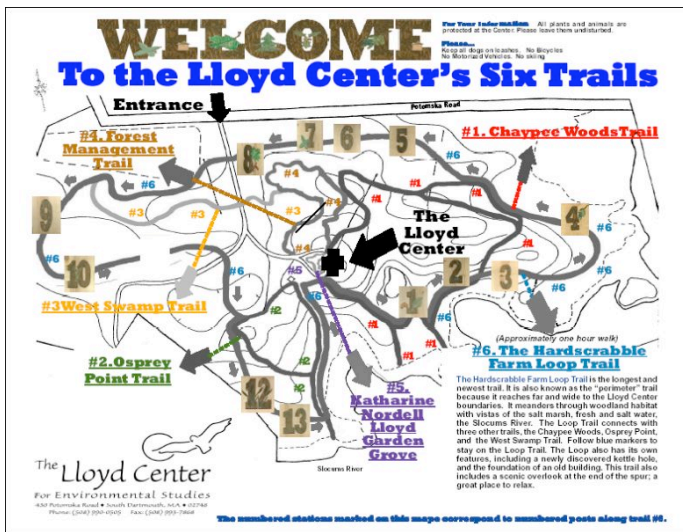


Figure 7. Map of trails at the Lloyd Center for the Environment. Trail names explain specifics about the paths.

The Schuylkill Center for Environmental Education

Philadelphia, PA

<http://www.schuylkillcenter.org>

- **Primary Focus:** environmental education, wildlife rehabilitation, land restoration, and environmental art.
- **Site Details:** 340-acres of woodlands, meadows, five teaching ponds and wetlands; 4 miles of hiking trails; main education building houses exhibits, gift shop, art gallery, meeting space, staff offices, and an on-site K-8th grade charter school; grounds also include a pavilion and amphitheater; picnic grove area, seasonal butterfly house exhibit, solar panel array, a wildlife rehabilitation clinic, and organic community gardens.
- **Organization Details:** not-for-profit institution.
- **Mission Statement:** The mission of The Schuylkill Center is to promote, through environmental education, the preservation and improvement of our natural environment by: Fostering appreciation, understanding and responsible use of the ecosystem;

Disseminating information on current environmental issues; Encouraging appropriate public response to environmental problems and; To maintain the facilities of The Schuylkill Center and conserve its land for the purpose of environmental education.



Figure 8. The solar photovoltaic array at The Schuylkill Center provides financial and environmental benefits and is an educational tool as one of the Center's permanent exhibits.

Science Museums/Centers

Sciencenter

Ithaca, NY

www.sciencenter.org

- **Primary Focus:** empowering young people to use science in shaping a better future and encouraging the long-term stewardship of our environment, society, and economy through education and action.
- **Site Details:** entire facility (building, mechanical systems and Science park) designed to be an exhibit and to be used to demonstrate the application of science; attached outdoor science park contains a number of science exhibits is itself an exhibit built on a North-South coordinate grid with most poles located on that grid.
- **Organization Details:** a 501(c)(3) non-profit educational organization.
- **Mission Statement:** To inspire excitement for science through interactive exhibits and programs that engage, educate, and empower.



Figure 9. Outdoor science park at the Sciencenter, Ithaca, NY.

**Museum of the Earth/
Paleontological Research Institute**
Ithaca, NY
<http://www.museumoftheearth.org>

- *Primary Focus:* Earth system change education and paleontological research and the Earth sciences, with a particular focus on the Northeastern United States.
- *Site Details:* 26,000 sq.ft. education and exhibit and research facility; permanent and expanding exhibit on climate and energy also displays the facility's geothermal heating systems.
- *Organization Details:* a free-standing not-for-profit organization with formal affiliation with nearby Cornell University.
- *Vision:* An educational facility that stresses the interdependence of the Earth and its life, fostering greater public understanding of the environment, its history, and its future.



Figure 10. Climate and Energy exhibit at the Museum of the Earth, which also allows for viewing into the facility's geothermal heating system.

Biosphère, Environment Museum
Montreal, QC
<http://biosphere.ec.gc.ca/>

- *Primary Focus:* eco-action, showcasing, observing and studying water and the Great Lakes-St. Lawrence River ecosystem.
- *Site Details:* the sphere is the former United States pavilion at the 1967 World's Fair with a set of enclosed buildings currently owned and operated by Environment Canada; includes permanent and rotating exhibits, age specific programming, tours, outdoor demonstration space, and conference rooms.
- *Organization Details:* Canadian museum.
- *Vision:* An exclusive venue to better understand major environmental issues, including those related to water, air, climate change, sustainable development and responsible consumption.



Figure 11. The Biosphère was once covered by a transparent acrylic skin. A fire destroyed this outer covering in 1976 and it was never replaced.

Organizing Organizations

The Centre for Sustainability
Vancouver, BC
<http://www.centreforsustainability.ca>

- *Primary Focus:* act as an important access and referral point for not-for-profit organizational development resources in British Columbia through the dissemination and cataloguing of information as well as training programs.
- *Site Details:* office that mostly assists individuals or groups through the internet or telephone.
- *Organization Details:* a not-for-profit organization.
- *Mission Statement:* To assemble, design and deliver well-funded, knowledge-rich and highly collaborative capacity programs for BC's not-for-profit organizations and their funders.

The Environment Centre Swansea
Wales, UK
<http://www.environmentcentre.org.uk>

- *Primary Focus:* assist environmental groups in the South Wales area by providing meeting and exhibition spaces, information regarding sustainability issues, offices facilities, photocopying/laminating, internet access, and demonstrations of renewable technologies.
- *Site Details:* converted warehouse/industrial building in downtown; emphasis on design of the centre to ensure that materials products, systems and environments have no adverse environmental or economic impact and embody the principles of sustainability.
- *Organization Details:* independent registered charity and Company Limited by Guarantee: Charity no. 1039378.
- *Mission Statement:* To raise awareness of environmental issues within all sections of the community. To encourage active participation by individuals and organisations in environmental projects. To promote change towards a more sustainable future.

Thoreau Center for Sustainability

San Francisco, CA/New York, NY

<http://www.thoreau.org>

- *Primary Focus:* green non-profit centers operated by Tides Shared Spaces (<http://www.tidessharedspaces.org/index.php>) typically providing office space, rental rates and lease terms oriented to the non-profit sector, and provide services, meeting space, and opportunities for collaboration and cost sharing; advocates the creation of Multi-Tenant Non-Profit Centers (MTNC's) as a sustainable infrastructure solution to meet the needs of non-profits.
- *Site Details:* San Francisco - 150,000 sq.ft., 12 buildings, over 60 non-profits; New York - 150,000 sq.ft., within 1 building, 10 non-profits.
- *Organization Details:* Tides Shared Spaces is part of Tides, a group of non-profits that share a common vision for a healthy society – a society based on principles of social justice, broadly shared economic opportunity, a robust democratic process and sustainable environmental practices.
- *Mission Statement:* Tides Shared Spaces creates, operates, and promotes sustainable workspace for non-profits and strengthens non-profit capacity in the real estate area.

Conclusions

The vision of a Center for Sustainability Education along an “Avenue of the Sciences” is a realizable future. Examples exist with precedents such as the Chicago Center for Green Technology. However, such endeavors are not ubiquitous. As an opportunity this is both exciting and challenging. Such a development would make Nashville a forerunner of progressive sustainable education and stewardship, objectives that are in keeping with Mayor Dean’s mission as well as the recommendations of the Mayor’s Green Ribbon Committee.

Citation Notes

Select wording in describing the Center for Sustainability Education was adapted from the report to the Honorable Karl Dean, Mayor, from the Green Ribbon Committee on Environmental Sustainability (June 2009).

All information and images gathered about the individual organizations was accessed from that organization’s website listed with their name and location.

Web sites accessed: 3-5 & 9-10 June & 6 July 2009.

This Case Study was created by the Nashville Civic Design Center. The report was written by Matthew Gonser (2009 Summer Intern) and edited by Gary Gaston, Design Studio Director.