



THE Cornerstone

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CASE STUDY

Highlighting the "Conserve" in Conservancy

Establishing a corporate headquarters while simultaneously minimizing the project's overall environmental impact can pose a challenge. In the case of the Western Pennsylvania Conservancy (WPC) headquarters, the desire to leave a light environmental footprint was aided by the decision to purchase an existing building. The Burke Building, constructed in 1836, stands as one of downtown



Pittsburgh's oldest buildings, second-only to the Blockhouse at Point State Park, which was built by Col. Henry Bouquet during the French and Indian War in 1764.

Due to its simple neo-Classical appearance, the limestone-clad Burke Building stands in sharp contrast to its much taller neighbors. Prior to the Conservancy's purchase of it in 1995 it has served, among other things, as law offices for the Burke Brothers, a bank and a restaurant.

"Upon learning of our plans to purchase and retrofit the building, the Heinz Endowments suggested we implement sustainable design principles in our plan," says WPC's vice president, Cynthia Carrow. "After learning about these

principles, we quickly concluded that would be the environmentally responsible way to proceed. We were anxious to create a model for others to follow."

Ms. Carrow was in charge of the project and quickly learned that renovating an existing building within an urban core not only minimizes the need for new construction and infrastructure, but also material transportation and employee commuting time. In such a case, the emphasis is on interiors and heating/ventilation/air conditioning (HVAC) rather than on the core and shell. In the end, the costs were comparable to new construction, but characteristics of the building that couldn't be duplicated – its charm,

history and integrity – were maintained.

There were several obstacles that prevented this process from unfolding smoothly, however. The building purchase stipulated utilizing an existing construction contract, turning virtually each green feature into a change order and result-

ing in a hurried schedule. Conservation Consultants, Inc. (CCI) presented a greening report on the building in January of 1995, the closing took place in February of that year and construction began in March. This aggressive, fast-track schedule is contrary to the ideal green design process, in which decisions are made prior to construction.

One member of the green design team, the U.S. Department of Energy, contributed building computer modeling services. "While the modeling was important, the results came too late to make much of an impact," says Chris Leininger, a consultant who worked with CCI at the time. While confirming some assumptions, the modeling also yielded some surprises. "Unlike

"Our decision to renovate this downtown building goes hand-in-hand with our mission of conserving land and reducing sprawl." --Cynthia Carrow, vice president of Western Pennsylvania Conservancy

conventional wisdom that would have treated this as a stand-alone building and called for insulating all four walls, modeling revealed that insulation was only necessary on the south wall," Chris continues. "The reality here was that, while the façade was south-facing, the three adjacent buildings were occupied

See **CONSERVE**, page 4

**THE BURKE BUILDING**

Owner: Western Pennsylvania Conservancy

Building function: Organization headquarters

Location: Downtown Pittsburgh

Date completed: 1995

Size: 10,000 total sq. ft. (5,500 usable sq. ft.)

Cost: \$85/sq. ft.

Architect: Landmarks Design Associates

Other team members: Conservation Consultants, Inc.; Rocky Mountain Institute; Carnegie Mellon University; Oak Ridge National Laboratories; U.S. Department of Energy



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from the ground up...



A view from the Executive Director

On a recent trip to France with my husband, I was once again reminded of the extreme sustainable lifestyle differences that exist between Americans and Europeans. The first thing that brought this to mind was our rental car, so small that we could barely fit two airplane carry-on bags in the trunk and with a back seat in which even the smallest toddler would be cramped. When we filled up this little car with expensive gas, however, it quickly became evident why everyone does not drive an SUV. Needless-to-say, the predominant European vehicles result in higher fuel efficiency, less pollution and smaller roads. Road lanes for supposed highways barely provide enough room for two cars to pass, let alone the occasional bicyclist who seems curiously unconcerned about the possibility of being run off the road.

Then, there are the totally dependable European trains and metros running like clockwork—in every direction, going every place you need to go. And, finally, you see a society that walks long distances and has no need for health centers. (I guess that's why the populace can eat all those croissants and still stay slim.)

While I thoroughly enjoyed all of these more sustainable modes of transportation, it is evident that the majority of Americans are unlikely to give up their gas guzzlers for a ride on the bus. While we should keep pushing for more light rail systems and other alternative forms of transportation, these are unlikely to have major impacts without economic incentives.

Another improbable scenario would be to see Americans lessen their desire for air conditioning at extreme and unhealthy levels. I was thrilled to find that every French hotel we stayed in had operable windows. I slept with them wide-open every night, thoroughly enjoying the fresh air. Would this be acceptable in the United States? It's doubtful since we tend to worry about the liability of potential security risks rather than the liability of a sick building or security risks from foreign oil dependency. Buildings account for more than 36% of this country's total energy use and we could easily save one-third of that percentage through improved efficiencies and the use of renewable energy supplies. Once again, however, market barriers exist. Construction budgets are seldom overlaid with operation budgets to consider achievable lifecycle savings. Additionally, we are not paying the real cost of energy.

While I was admittedly on vacation and falling into the "it's always 'greener' on the other side of the fence" perspective, there are clearly attitudinal and cultural changes that would need to occur if Americans were ever to attain a more sustainable lifestyle. Clearly, we do not currently have the necessary economic incentives to reduce resource use. Gasoline prices will continue to be affordable here, rather than soar to the \$4 to \$5 per gallon range found in Europe. The use of landfills will not be fully assessed, and children will be medicated rather than placed in healthy buildings and communities.

Americans currently consume the equivalent of three Germans, six Mexicans, 14 Chinese, or 38 Indians (statistics furnished by the U.S. Green Building Council). The U.S. population alone could likely make the difference needed to bring the world down to 100% of carrying capacity from its present 120%, a figure just reported in a natural capital study in the Proceedings of the National Academy of Sciences. Perhaps we need to consider including a fourth "R"—restoration—in into basic school curriculum in an effort to begin to make significant cultural shifts.

France was wonderful, but it reminded me of how far we Americans have to go and that attitudes are harder to change than technology.

Rebecca
Rebecca

Green Spotlight on...

Sustainability Indicators

Cornerstone speaks with Court Gould

Q: What new tool has been developed to measure sustainability in the Pittsburgh area?

A: Sustainable Pittsburgh (SP) recently completed the first on-line Sustainability Indicators report for our region. The *Southwestern Pennsylvania Regional Indicators Report* was created through a public process to develop long-term goals and corresponding indicators of success. It provides feedback about past trends that are shaping the future and helps us focus on pressing problems, celebrate successes and make smarter decisions.

The report's data gives useful insights to trends in the region and the way the data is presented suggests a new way of seeing linkages between issues. Also, the actual process of developing the report tells us something about ourselves.

Q: How did the report come into being?

A: The report is the product of an ongoing conversation in our region about the future. It began with 250 people who met in approximately 40 meetings over a two-month time period and continued with six forums held around the region to review a draft report. The jury is now in—many people of this area embrace and are accelerating the concepts of sustainability. They desire economic development and a higher quality of life for all people, both now and in the future. They also want social progress and to protect and enhance the environment.

Q: How is information presented in the report?

A: Responding to the public's insights, the report focuses on the many connections between issues and trends. For example, we heard people lament sprawling land use patterns that diminish the beauty and character of our surroundings and ultimately make the region less attractive to investment and quality economic development. By presenting the report's 21 indicators in compass-point clusters—by Nature (N), Economy (E), Society (S), and Well-being (W)—readers are better able to understand these sorts of issue linkages. Also, this provides an intuitive framework for plotting not only where we are, but the path we should take to ensure a more sustainable tomorrow.

Q: What does the data say?

A: Taken together, the indicators suggest four key challenge areas where our region needs to take stock of its long-term sustainability and four overarching strategies to advance us toward a positive result:

- We must slow, stop, and then reverse the increasingly inefficient and increasingly wasteful use of land and resources.
- We need to build on our foundation of economic stability to improve the vitality of the region, thereby attracting talent, stemming the outflow of the next generation to other cities, and improving the security

of the region's poorer citizens.

- There must be an investment in education, social engagement and social capital, all of which are also excellent strategies for improving economic performance.
- Lastly, we need to look deeper into factors that relate to a high quality of life for all of our citizens, determine if we are achieving them, and seek to better steer toward them.

Q: What do you hope this report will accomplish?

A: By bringing many different kinds of indicators together in one broad picture, this report reminds us of the need to monitor a range of signals and to be watchful for the linkages between them. We trust users will find the goals and indicators report to be insightful and that it will help them to recognize opportunities for change throughout our region.

To learn more and to contribute your own insights, view the report as it is presented in an interactive website at www.sustainablepittsburgh.org/SWPAIndicators. Also on this site is a downloadable copy of Sustainable Pittsburgh's just released *Community Indicators Handbook*, a how-to guide for municipalities and neighborhoods interested in creating their own local indicator projects.



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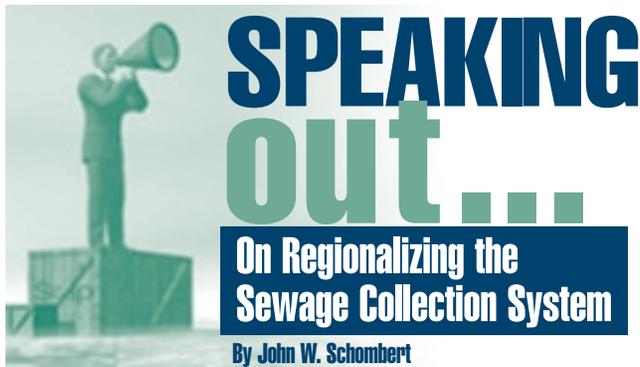
Sustainable Pittsburgh is a public-policy advocacy group that links economic prosperity, ecological health and social equity. Court Gould, who has been with SP since its inception and serves as the organization's director, has a masters degree in public administration and experience in federal, state and local government. He is chair of the Local Government Academy and Friends of the Riverfront.

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Your contributions are greatly appreciated!

Thanks



The deteriorated state of our region's sewage infrastructure is creating unsafe and unhealthy conditions in local streams and rivers. Within the ALCOSAN service area, the sewage collection system is an integrated network of systems that have evolved over the past 100 years.

Today's elected officials are tackling the issue of how to efficiently and cost-effectively rehabilitate our sewage infrastructure to meet federal, state and local requirements, as well as to improve Pittsburgh's water resources. Adding to the complexity of the problem is the number of municipalities involved, each of which owns a piece of the total sewage system.

Similar to our gas and electricity services, sewage collection systems should be operated and maintained as a utility by one or several municipal authorities or entities. This type of regional approach would result in a system-wide, cost-effective, sustainable solution. Currently 83 municipalities and authorities operate and maintain individual portions of the collection system independent of each other. This process, however, has several serious limitations:

- **It's ineffective because municipal systems are interconnected.** Municipalities do not have complete control over the flows from other communities, both upstream and downstream, and therefore, they should cooperatively identify the causes of overflows and work to develop a system-wide solution.
- **It's expensive due to the equipment and services required for the regular operation and maintenance of a sewer system.**
- **It's not the most cost-effective approach.** If individual municipalities make costly investments in one small part of the system, those investments may burden ratepayers more than necessary.

Communities must work together to create a common vision for the future, one that incorporates the benefits of area-wide management, organizational strength and sustainability:

- **Regional assessment offers simpler compliance.** Municipalities must develop a plan to assess, evaluate

and rehabilitate the entire collection system in a standardized, methodical manner. If municipalities continue to work only within their own boundaries, compliance will be more difficult to achieve and more costly overall.

- **Regional planning identifies the investments that are needed most.** Addressing problems only within individual municipal boundaries is ineffective because the repair or rehabilitation may not significantly contribute to a system-wide reduction in overflows.
- **Regional organizations have greater buying power.** Municipalities can purchase public works supplies in bulk and pass the savings on to their communities.
- **Regional action reduces duplication.** Rather than each community owning the equipment necessary to maintain its sewage infrastructure, municipalities can share these resources.
- **Regional financing saves money.** Cooperative financing mechanisms such as bond pools can decrease the cost of borrowing money.
- **Regional operations save time and money.** Municipalities are subject to increasingly stringent requirements covering the management and operation of sewage collection systems. With hundreds of interconnections among the municipal collection systems, regionalization can result in consolidated operations and a reduction in the number of permits and inter-municipal agreements needed.
- **Regionalization reduces municipal burden.** Removing the responsibility for sewer collection systems from municipal governments allows officials to focus on projects that can be addressed within an individual community's boundaries.
- **Regionalism results in a stronger voice in Harrisburg and Washington.** Where a single municipal voice is often lost at the state or federal level, a regional voice can carry significant influence.

Municipal officials throughout ALCOSAN's service area have been participating in 3 Rivers Wet Weather Basin Groups, meeting monthly to develop a comprehensive regionalization strategy that offers the best solution to a complex problem.

John Schombert is executive director of the 3 Rivers Wet Weather Demonstration Program, a non-profit organization dedicated to helping Allegheny County communities solve the sewage overflow issue. Prior to joining 3 Rivers, Mr. Schombert worked for nearly three decades in the Allegheny County Health Department's water pollution, public drinking water and waste management programs, most recently as chief of Public Drinking Water and Waste Management. To learn more about this issue, you can contact Mr. Schombert at jschombert@achd.net.

Opinions expressed in Cornerstone are not necessarily those of the publication or the Green Building Alliance.

Briefly Stated...

A FREE "BUY RECYCLED GUIDE FOR PENNSYLVANIA BUSINESSES" contains information on financial savings and the high quality of many products made with recycled content. The binder also tells you where and how to buy recycled items, how to save money by reducing energy bills and how to reduce waste. For your copy, call the Department of Environmental Protection's recycling hotline at 800-346-4242.

A HEFTY 700-PAGE BOOK ON INNOVATIVE AND STATE-OF-THE-ART HOUSING REHABILITATION has just been published by McGraw-Hill. Written by Steven Winters Associates, Inc. and based on research conducted for the U.S. Department of Housing and Urban Development, the comprehensive guide incorporates many energy conservation, sustainability, indoor air quality and mold mitigation techniques. *The Home Rehabilitation Handbook—Techniques for Home Renovation* can be purchased through Amazon (www.amazon.com) or through Michael J. Crosbie, the book's editor, at mcrosbie@swinter.com.



ALERT FOR CLEAN-FUEL VEHICLE BUYERS! Consumers who purchase (not lease) such vehicles are eligible for a maximum \$2000 tax deduction (from gross income) under the Energy Policy Act of 1992. Today's hybrid vehicles meet the 1992 standards and all clean-fuel vehicles placed in service before 2007 will qualify.



IN A RECENT ANNOUNCEMENT, EIGHT PENNSYLVANIA COLLEGES AND UNIVERSITIES committed to purchasing wind-generated electricity from new state wind farms. That brings the total number of such PA institutions buying this type of power to 25, the most of any state in the country.

SOUTHWESTERN PENNSYLVANIA'S (NORMAL) CLIMATE doesn't fit in the "hot and dry" category, but for those areas that do, the Department of Energy recently released the first of seven volumes of design guidelines for energy-efficient schools. It covers a wide range of techniques for schools in hot and dry climates, and includes numerous case studies. The remaining six volumes will cover the other U.S. climate zones and will be released this summer. Visit www.eren.doe.gov/energysmart/schools/ for more information.

A NEW PESTICIDE-FREE WEED CONTROL SYSTEM has municipal and agricultural applications for such locations as schools, parks, gardens, golf courses, roadways, airports, tennis courts, industrial areas, vegetable crops and nurseries. Manufactured by Waipuna, a New Zealand-based company, the system generates a biodegradable foam mixture of corn and coconut sugars that is added to boiling treatment water to produce an organic hot foam. For more information on this product, visit www.waipuna.com or contact Paul Spackman at 630-514-0658 or pspackman@waipuna.com.

GAMING AND OUTDOOR ENTHUSIASTS HAVE PLAY IT AGAIN SPORTS, a used sporting goods store, and now regular consumers have Use it Again, PA!, a new on-line resource guide that allows Pennsylvanians to search for businesses that rent, repair or sell a variety of used products. A search can be made by either product type or location, and businesses from seven metropolitan areas (including Greater Pittsburgh) are highlighted. The aptly named website, www.useitagainpa.org, also contains detailed and up-to-date recycling information for each of the metropolitan areas.

UPCOMING EVENTS

The 3 Rivers Wet Weather Demonstration Program is hosting the fourth annual Sewer Rehabilitation Conference on September 16-17. It will take place at the Sheraton Inn Pittsburgh North in Warrendale. Please call the Local Government Academy at 412-237-3171 or 3 Rivers at 412-578-8375 for further details.

Also, a free training session will be held July 25 at the Penn Stater Conference Center in State College for communities with Combined Sewer Overflows (CSOs). The training will be based on the Department of Environmental Protection's recently finalized CSO Policy and CSO general NPDES permit. For more information, contact John Wetherell at 717-705-0486. To register, call the Pennsylvania State Association of Township Supervisors at 717-763-0930 or visit www.psats.org.

Groundbreaking Ideas...

Don't Turn Up Your Nose at this Technology

Every year more than 20 billion gallons of untreated sewage and stormwater escape from overflowing sewer and malfunctioning septic systems into waterways and groundwater in Allegheny, Armstrong, Beaver, Butler, Fayette, Greene, Indiana, Lawrence, Somerset, Washington and

The major obstacle to widespread use of waterless urinals is the perception about hygiene and odor. Although a valid concern, flush-free urinals are actually a hygienic improvement over their water-flushing cohorts.



Westmoreland counties. One method to control sewage problems (see related "Speaking Out" article on page 3 to read about other solutions) is to reduce the amount of wastewater that needs to be treated. Green building practices encourage designs that mitigate stormwater run off, as well as high-performance, water-saving technologies. One example of the latter is the no-flush urinal, of which there are currently two

manufacturers, Waterless Company and Falcon Waterfree Technologies. Various models of their water-free urinals not only save a precious resource, but also save money through design and maintenance, and, believe it or not, offer hygienic advantages over traditional flush urinals.

The founders of Waterless and Falcon were once partners, but disagreements on design issues caused them to separate. The new competition between these two companies has been good for advancing the development of this sustainable commercial technology. In principal, their two systems are similar: urine flows to a disposable trap-cartridge and is contained under a layer of lighter-than-water liquid; excess urine flows down the drain without the need for a water flush, saving between one to three gallons of water with each use. Both companies claim their product can save an average of 40,000 to 45,000 gallons of water per urinal annually. With acceptance from local code agencies and wider implementation in area facilities, this technology could have a wide-ranging impact on the region's water usage and subsequent treatment, while producing significant savings on water bills for build-

ing owners.

Aside from these benefits, the no-flush urinals can decrease installation and maintenance costs. If specified for new construction there is a notable savings through decreased plumbing costs, as the systems need no water supply, only a drain. Although Waterless Company estimates a related annual savings of \$80 to \$120 per toilet, mainly through the elimination of mechanical components that regularly clog or break, there are material and labor costs associated with replacement of the trap-cartridges approximately every three to four months.

Philadelphia architect Scott Kelly needed a way to convince clients to use waterless urinals for their projects so he brought several of them to Harrisburg to tour the Turnpike Authority's office building where 14 units are housed. "After I initially toured this building with its users, we did a few calculations to determine the increase in construction costs for the waterless urinals over standard urinals. While the increase was \$2,500, the owner is now saving \$2,200 per year in water bills. That's an 88 percent return on investment—without even including the money saved in flush valves!"

As one could guess, the major obsta-

cle to widespread use of waterless urinals is the perception about hygiene and odor. Although a valid concern, both brands of flush-free urinals are actually a hygienic improvement over their water-flushing cohorts. Falcon and Waterless models are designed to dry out completely after each use, thereby eliminating the moist environment in which airborne bacteria (from co-existing flush toilets) settles and thrives.

The use of the lighter-than-water trap fluid, BlueSeal[®], separates urine from outside air, subsequently containing unpleasant smells. The design of Waterless Company's cartridge removes a small portion of BlueSeal[®] with each use, so more of the agent must be added after every 1500 uses. The addition of this liquid is unnecessary in the more complex (and expensive) trap design used by Falcon.

As communities struggle with combined sewer overflows and related issues, water-reducing technologies such as these urinals will play a much more important role. Also, as the public gains an understanding of the environmental, economic and health advantages of this equipment, its acceptance in the marketplace will grow.

For further information, visit the Waterless Company at www.waterless.com and Falcon Waterfree Technologies at www.falconwaterfree.com.

CONSERVE *continued from front cover*

and heated and each of the walls was about 24 inches thick."

During the process of evaluating green alternatives, several options for HVAC were considered: a raised floor system, normally a good technology for offices, wasn't suitable for a historic building; the payback for geothermal heating was thought to be too long, particularly due to the difficulty of drilling the wells; and, aesthetically, too many panels would have been required for radiant cooling. The decision was therefore made to install a roof-mounted natural gas-fired unit with an economizer. This unit, along with a humidity-reducing dessicant wheel, allowed the cooling load to decrease from

350 sq. ft./ton to 550 sq. ft./ton. "This commitment was made prior to utility deregulation, when power cost 13 cents per kilowatt hour," says Gary Goodson, also formerly with CCI. "Electric units now seem to be the way to go, more so for reliability and maintenance rather than power costs. There was no way to know that, however, back then." Although well-performing and clean-burning, the unit is noisy and unreliable. Additionally, the maker of the unit went bankrupt, leaving WPC with no warrantee.

Originally designed as a passively cooled structure with a large center hall, significant thermal mass and high ceilings, the Burke Building also boasts large, operable windows with original interior wooden shutters. Low-e film coatings on the façade windows were considered, but would have changed the exterior look. The commendable goal of one watt per square foot was achieved for lighting, aided by interior windows that transmit daylight well into the building, skylights, LED exit lights and direct-indirect lighting fixtures.

An effort was made to reuse materials and to use healthy materials. Some of these are detailed in the "green high-

green highlights

sustainable site: adaptive reuse of a historic building within an existing downtown core; bounded on three sides by occupied buildings **energy & atmosphere:** efficient, natural gas-fired HVAC unit with economizer cycle conditions 550 sq. ft./ton cooling; dessicant wheel for humidity reduction; efficient lighting of one watt/sq. ft.; skylights and borrowed lights to maximize daylighting **resources & materials:** demolished wood framing was remilled into shelving; kitchen casework was entirely reused **indoor environmental quality:** healthy finishes, wool carpets, no-VOC paint, linoleum flooring, Homasote walls, green house-keeping **process:** use of sustainable design consultants; team approach for evaluation and goal-setting; DOE 2 modeling performed

lights" section and were contributing factors to occupant comfort and productivity, which is estimated to have increased as a result of the move.

The project won a Governor's Award for Environmental Excellence and pioneered much of the green building conventional wisdom in Pittsburgh. "Back in 1995, there weren't many examples of green projects to point to here," Carrow says, "plus, LEED™ wasn't really usable yet." (WPC is now considering registering their headquarters as a LEED™ Existing Building.) "Despite all the bumps in the road, this building was a natural for us; it symbolizes what we are."



A wall-mounted uplight fixture complements natural daylighting, while tin ceilings preserved from the turn-of-the-century reflect light deeper into the interior space.

The Cornerstone is published quarterly by the Green Building Alliance, a Pittsburgh-based non-profit organization that provides expert services and reliable information to facilitate green building solutions – and, in the process, helps our region thrive.

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