Case Studies

Green building programs are becoming standard practice in communities across America and important trends are materializing. These trends and many others are explored in the case study component of this publication. The case studies are meant to provide those in the public sector with actionable data, because one of the ultimate purposes in collecting this information is to create quantifiable best practices that communities can use as they begin or strengthen their own green building programs.

The programs that were chosen for the case studies in this report provide an excellent cross-section of American green building policy. A particular focus has been placed on newer or strengthened green building programs with green economic development efforts. The current state of green building laws is not consistent, but instead is a good representation of the American federal system of government. Local communities have the authority to choose their own laws and, while they have taken many ideas from others, on the whole they have been quite inventive at creating unique aspects in many of their green building programs.

2009 Case Studies

Los Angeles

Boston

Grand Rapids

Philadelphia

Nashville

In the first report, a *Study of Green Building Programs in Our Nation's Communities,* the AIA highlighted green building programs in Austin, Tex.; Scottsdale, Ariz.; San Francisco; Portland, Ore.; Atlanta; and Chicago. Many of these cities are often thought of as the pioneers in municipal green building.

In *Green Building Policy in a Changing Economic Environment*, the following communities have been chosen, because they have either strengthened existing green building policies or developed innovative policies that were in their infancy when first contacted in 2007. These five cities exemplify best practices in municipal green building.

Also, these communities are tying sustainability into broader economic goals, thereby creating practices that will work toward creating a more environmentally sound and economically advantageous future. While this list of case studies could easily be expanded, we feel that the diversity in policy exhibited by these communities provides a good overview of the best practices of green building on the local level.

Los Angeles, as the second-largest city in our country, makes a big difference through the choices it makes, and it has chosen to be a leader on sustainability. With the medley of issues that confront big cities on a daily basis, it is heartening to see that the city's efforts to build a healthier, more energy-efficient future are a core focus of L.A.'s leadership. Los Angeles has long been a trailblazer on environmental issues, and was identified as one of the original 17 cities to have a green building program in place pre-2003. The city reinforced its reputation as an environmentally progressive city on Earth Day 2008, by passing a mandatory green building policy, matched by few other large cities, which strengthened its long-term sustainability goals.

Rampart Community Police Station, Los Angeles; architect: Nick Seierup/Perkins + Will; photo by Michael Urbanek/ ArchitecturalShots.com

GREEN LA

Mayor Antonio Villaraigosa has been an effective advocate for sustainability measures during his tenure as mayor. He launched GREEN LA in May 2007 in partnership with the Los Angeles City Council and community environmental leaders to reduce greenhouse gas emission levels to 35 percent below 1990 levels by 2030 and increase the city's use of renewable energy to 35 percent by 2020. The overall goal of GREEN LA is to make Los Angeles the biggest, greenest U.S. city. Through these core measures and more than 50 other initiatives included in this program, the city is on its way toward achieving these goals.

Los Angeles city government owns the largest municipal utility in the country, which provides it with a unique opportunity to more directly affect the makeup of electricity production, a major source of greenhouse gases. However, investing in municipal energy efficiency and renewable power production is only one part of the solution. Key focus areas of the plan include the promotion of green energy in the private sector, water conservation, increased open space and park land, and an innovative, far-reaching green building program that began in 2002 and was strengthened in 2008.

Green Building Requirements

The original focus of Los Angeles' green building program was municipal construction. This focus changed on Earth Day of 2008 as the program was expanded when Mayor Villaraigosa signed the Los Angeles Green Building Ordinance. The new ordinance applies green building requirements to the commercial and multifamily sectors, mandating that new commercial buildings more than 50,000 square feet and multifamily development with 50 residential units or more meet a minimum of LEED Certification.

The ordinance covers a number of important areas that have been instrumental in developing successful green building programs in cities across the country. Projects receive expedited permitting, through all departments, if they meet at least LEED Silver designation. City codes are being reviewed continually to make sure that environmentally sound and technologically superior processes and materials are integrated into the code. A cross-departmental sustainability team has been created to review and update green building policy, and also provide the development community with ongoing communication channels to city staff.

A key finding in the first *Local Leaders in Sustainability* report showed that the formation of cross-departmental "green teams" helps to break down institutional barriers, or the "siloing" effect that often occurs in municipal governments. By taking these steps, communities are able to successfully implement long-lasting green building programs. In Los Angeles, municipal employees and department heads also are trained in green building methods and policies, with ongoing annual budget outlays for these training programs. Additional financial incentives and awards are offered as well to encourage green building within the city.

Sustainable Design Implementation Program

GREEN LA built on the work of city leaders stretching back to 1995, when the Los Angeles City Council funded the Sustainable Design Task Force. This group is headed by the City Architect and made up of a voluntary group of city employees and local design, engineering, waste management, and construction experts, laid the foundation for the city's green building program. The task force set out to identify and counter barriers to sustainable growth. At the time, barriers were found in four key areas: lack of information, institutional resistance, regulatory obstacles, and financial impediments.

The Sustainable Design Implementation Program first convened, again under the direction of the City Architect in July 2000. Within three years, the program already had dispersed upward of $4 million in grant money, furthering green building training seminars and incorporating green techniques in an increasing number of city projects. This came to a head in June 2003 with the publication of the *Sustainable Building Initiative*, a 5-year plan requiring municipal structures to build to the certified level of LEED in new construction projects and major renovations. This $1 billion expenditure aimed to secure a foothold for green building in

the community by mandating city projects over 7,500 square feet build to the LEED Certified standard. As the green building program had been passed in 2002, the implementation of the *Sustainable Building Initiative* helped fulfill the mission of community leaders, architects, and civically engaged community members involved in the process.

Green Economic Development

Green building and sustainability initiatives create incredible economic development opportunities, and Los Angeles has been quick to capitalize on its leadership in this area. Through EnvironmentLA, the city's Environmental Affairs department, a number of economic development efforts have been established, including the proposed Certified Green Business program,

Rampart Community Police Station, Los Angeles; architect: Nick Seierup/Perkins + Will; photo by Michael Urbanek/ArchitecturalShots.com

Department of Water and Power economic development, the Go Green program, and the Mayor's Business Team.

The Certified Green Business program has been proposed by Los Angeles Councilmember Richard Alarcón, and is modeled on the successful Bay Area Green Business program. The purpose of this program will be to promote and recognize businesses, as well as government agencies that operate in a more sustainable fashion by becoming a certified green business. To become certified, a participant will have to comply with regulations and standards on conservation, pollution prevention, and waste mitigation. Through this program citizens will have the opportunity to evaluate businesses based on whether they are green, thereby encouraging further businesses to participate in order to maintain competitiveness. The planned rollout of the program initially concentrates on the hospitality industry through the certified green hotel program and then will move to the restaurant and auto repair industries before it is broadly adopted by additional industrial and commercial sectors.

The Go Green program is an incentive-based program to help businesses become greener. The program provides a free energy-efficient lighting assessment, rebates for refrigeration equipment, free shade trees, incentive payments for solar power, cash rebates for purchasing a wide range of water-efficient appliances, as well as many other effective incentives to encourage sustainability and green building in the city. The Certified Green Business and Go Green programs are examples of the efforts being expended by Los Angeles government to push the city in a sustainable, economically competitive direction.

A recently passed law, the "Green Building Retrofit Ordinance," will help green existing city buildings while increasing the number of green jobs in Los Angeles. This ordinance requires that all city-owned structures larger than 7,500 square feet or built before 1978 will be retrofitted with a target of reaching LEED Silver. This ordinance is specifically targeted first at retrofitting buildings in low-income communities and buildings that directly benefit communities, such as recreation centers and libraries. The ordinance also seeks to create

Rampart Community Police Station, Los Angeles; architect: Nick Seierup/Perkins + Will; photo by Michael Urbanek/ ArchitecturalShots.com

a pathway for economically disadvantaged workers to become green collar workers, foster inner city economic development, and use local green manufacturers.

There are additional initiatives, in conjunction with the city, that are positioning Los Angeles for green economic growth. CleanTech Los Angeles is a collaboration between the Community Redevelopment Agency, Caltech, the Department of Water and Power, NASA's Jet Propulsion Laboratory, the Mayor's Office, Port UCLA, and USC, meant to place L.A. at the forefront of research, commercialization, and deployment of clean technologies. This program has created a series of three primary goals: create jobs, stimulate demand, and facilitate environmental solutions. These efforts combined with L.A.'s natural position as a leader in California will continue to position it strongly for green economic development in years to come.

Small-Scale Green Building

Stuart Magruder, AIA, LEED AP, Studio Nova A Architects, Inc., and AIA|LA Treasurer commented on some of the difficulties and solutions that small-scale practitioners find when designing sustainable projects.

As the work of my studio has been focused on small-scale residential and commercial projects, I am starting to see what I call the Home Depot effect. For projects that have low square footage budgets, if a material is not available at Home Depot, it is very difficult to use the material. Three factors seem to drive this effect. The first is low expectations coupled with little to no understanding of the value of sustainable materials for most clients in this end of the market. Second is the limited local availability and long lead time to receive an item – if it is not stocked by Home Depot. And third is a resistance to new materials from most contractors.

The one advantage I do see to the Home Depot effect is that it encourages simple solutions. High-tech sustainable strategies are appropriate for projects that will be well-maintained once the owner takes the building over. Large institutional projects and office buildings with dedicated maintenance

staff can handle the demands of a mechanically operated louver system or a complex boiler and chiller plant. But as the project gets smaller, the simpler the solution, the longer that solution will actually work.

Green Schools

Green schools promote energy savings, effect positive environmental change, improve health and educational achievement, and provide hands-on learning experiences to students and faculty. The Los Angeles Unified School District (LAUSD) was the first school system in California to adopt the California High Performance School Standards (CHPS) and also has created a goal of 10 percent reduction in energy and water consumption by 2012. Currently the city is in the process of designing and constructing 132 new schools by 2013, with 76 completed to date meeting CHPS criteria. This program not only benefits the school system through water and energy cost savings, but also creates a more knowledgeable student body as pupils have lessons on sustainability integrated into their curriculum.

California Statewide Initiatives

California has proven itself as the leader on environmental sustainability in the United States. In the green building sector, California is looking to the future with a set of realistic goals, and a strategy to achieve their desired results. Governor Schwarzenegger signed Executive Order S-20-04 (Title 24) in December 2004, which established the goal of reducing energy use in California's multitude of state-owned buildings by 20 percent before the year 2015 and encourages the private commercial sector to set the same goal.

These efforts were reinforced and expanded in 2008, increasing the energy-efficiency requirements in new construction 15 percent to 20 percent over current Title 24 requirements, thereby instituting requirements more than 20 percent over national Department of Energy standards.

This goal combined with other important statewide green building efforts has created an environment in Los Angeles for green building and other sustainability initiatives to thrive for years to come. With concerted action from those in the design community, residents, and consummate political leadership on these issues, Los Angeles has positioned itself as a forward-thinking big city leader on green building, and we should expect to see continued environmental innovation .

AIA/COTE Involvement

When asked about AIA COTE's involvement, Los Angeles COTE Co-chair Christine SE Magar, RA, AIA, LEED AP, noted:

For years, the Los Angeles COTE chapter held monthly education programs on green building. With the success of the USGBC and the USGBC-LA chapter's education program, COTE-LA decided to make its impact in a different way: In 2006, we focused on greening the AIA National Convention held in L.A. that year with several initiatives. We offered attendees the opportunity to offset their carbon emissions from the conference by handing out Carbon Offset Cards and we published the L.A. Metro Green Map. It illustrates the downtown area pointing to various green highlights in the city and at the major metro stations. It is meant to show both L.A. residents and visitors the green opportunities already available in the city. In 2010, COTE will be partnering with the local utilities and visitor organizations to update, print and distribute the map.

In 2007, we decided to have an impact on the municipal level and conducted monthly meetings at L.A. City Hall on the subject of a green building program. Representatives from city departments, the city utility, the mayor's office and council-person offices participated. Subjects discussed included watershed, rainwater management, greywater cycling, building code obstacles to green building, energy and water conservation incentives, etc. These became the seeds to the L.A. Green Building Program and Ordinance, which later began a more formal process of development, being adopted on Earth Day, April 22, 2008.

In 2008, we focused on helping a Business Improvement District (BID) meet its "Cool District" goals to reduce their carbon emissions 80 percent by

2050, 2 percent every year for 40 years. We held and documented two eco-charrettes. The first one was conducted with local green experts and the community to do out-of-the-box envisioning. The second one was conducted with city departments and the utilities focusing on case study segments of the vision. This year we have continued our support of the BID by conducting monthly panel discussions focusing on various topics that address carbon reduction relevant to the L.A. community in general and the BID in particular.

Additional Resources

GreenLA
http://www.lacity.org/mayor/villaraigosaplan/EnergyandEnvironment/LACITY_004467.htm

L.A. Green Business Programs and Services
http://www.lacity.org/ead/environmentla/programs/businessprograms.htm

L.A. Green Business Certification Program
http://environmentla.org/cgbp/learn.html

CleanTech Los Angeles
http://cleantechlosangeles.org/about_us/

California Executive Order S-20-04
http://www.energy.ca.gov/greenbuilding/

California Green Building
http://www.ciwmb.ca.gov/greenbuilding/

L.A. Green Building Ordinance
http://mayor.lacity.org/stellent/groups/electedofficials/@myr_ch_contributor/documents/contributor_web_content/lacity_004865.pdf

L.A. Green Tech Corridor
http://blogdowntown.com/2009/04/4226-mayor-touts-green-corridor-but-can-downtown

L.A. Metro Green Map
http://www.greenmap.org/greenhouse/en/user/328

AIA LA COTE
http://www.aialosangeles.org/committees/cote.html

Boston is a big city leader on green building, and the first major U.S. city to implement its green building program by amending the zoning code. The urban fabric of the city has evolved through successive generations of development over almost 400 years of the city's existence, leading to a historically pleasing dense, walkable, vibrant environment. The city's green building leadership developed after quickly implementing many of the Mayor's Green Building Task Force recommendations on a comprehensive green building plan. The outcome has been impressive, with green building now ingrained into the development DNA of the city of Boston.

Macallen Building Condominiums, Boston; architect: Burt Hill, Office dA; photo by John Horner Photography 2008

> "High-performance green building is good for your wallet. It is good for the environment and it is good for people."
>
> —Boston Mayor Thomas J. Menino

Mayor's Green Building Task Force

In 2003, Mayor Thomas M. Menino and the Boston Redevelopment Authority formed a Green Building Task Force to study how green building practices could be encouraged in Boston. After a 12-month study, the Task Force recommended a set of initiatives, implemented in January 2007 as an amendment to the Boston Zoning Code Article 80 (Development Review and Approval).

The task force was composed of public and private experts in the field, including Mike Davis, AIA, LEED AP, vice president, Bergmeyer Associates, and chair, Boston Society of Architects Legislative Affairs Committee, in order to recommend a comprehensive green building plan for the city. The change to the zoning code was one of the major recommendations offered by the task force.

Macallen Building Condominiums, Boston; architect: Burt Hill, Office dA; photo by John Horner Photography 2008

> *Zoning is an instrument of public policy. When the relationship between building energy use and climate change is made clear, a municipality will want to do something to drive greater efficiency. The tool for a municipality is its zoning ordinance, Davis said. When a governing body says that we need to do something about climate change, then you need to look for people with specialized expertise, and in this case it was people who knew about green building and policy.*

In the end, the change to the zoning code was one of the major recommendations offered by the task force. Another significant recommendation from the Mayor's task force was for the city to become more involved in state policy, which it has done in a number of areas in recent years.

Green Building Zoning Code

"Article 37" requires all major new and rehabilitation construction projects exceeding 50,000 square feet to earn 26 LEED-New Construction (NC) points. In addition, a further four points reflecting city priorities, including transportation, energy, historic preservation, and groundwater recharge were added to the checklist. The city does not require third-party certification; rather Boston officials review and confirm developers' certifications.

The zoning code was viewed as an effective tool for public policy in Boston. This green building provision also bolsters other sustainability efforts in the city, including minimum LEED Silver certification of government buildings and city-supported projects. Furthermore, the city sees the business case for green

buildings to be compelling and views the ancillary green collar jobs created as a further strong incentive for the program.

"We are very excited to be at the forefront of green building practice. The business case for Boston, which has guided this initiative, is very compelling for the city, and especially for the architectural community," says John Dalzell, senior architect, Boston Redevelopment Authority.

This measure provides a concrete example of how a large American city can move its zoning code into the 21st century. The inclusion of green building standards directly into the code dramatically increases the number of green buildings constructed, with Dalzell reporting that since the program has been instituted in 2007, there are now 33 LEED Certified projects, or 7 million square feet of space. These buildings include 1 LEED Platinum, 8 Gold, 13 Silver, and 11 certified projects. There also are about 140 projects registered that are not yet certified.

Green Affordable Housing

As part of the city's green building amendment to the zoning code, Boston is working to develop green affordable housing. There are three primary focal points to Boston's green affordable housing program. Green homes should use green building materials and technologies to reduce maintenance and energy costs for homeowners and renters. Green affordable housing should advance resident health and well-being. Finally, these homes will minimize environmental impacts through water conservation and greenhouse gas emission reduction.

The program requires that all affordable housing projects meet the LEED Silver Standard, with projects either meeting the LEED for Homes or LEED NC standard depending on the size of the building. Projects that are three stories or below must also meet the Energy Star for Qualified Homes standard, or its equivalent, while those buildings four stories or larger must exceed the ASHRAE 90.1 (2004) standard by a minimum of 20 percent.

Macallen Building Condominiums, Boston; architect: Burt Hill, Office dA; photo by John Horner Photography 2008

Economic Sustainability

The Boston Redevelopment Authority guides economic development in the city to create a strong economy. Officials have been able to attract clean tech investment dollars into Boston by having the same government agency focused on economic development and green building. In fact, *Boston Business Journal* reported that the Boston area received a total of $387.17 million in clean tech investment in 2008, a 6 percent gain over 2007 in this sector. With a total of $4.69 billion invested in this sector nationally, Boston attracted nearly a tenth of all such investment in the country, clearly positioning it as a sustainability leader.

Boston's Green Tech Initiative is a reflection of the strong commitment exerted by the city's leadership on matters of sustainability. This initiative, started in 2008, attracts green businesses to the city through assistance measures, and works with existing small to mid-size businesses to green their operations. As the

Macallen Building Condominiums, Boston; architect: Burt Hill, Office dA; photo by John Horner Photography 2008

program continues to develop, the ultimate plan is to offer a one-stop shop on sustainability for businesses.

The Sustainable Business Leader program is another initiative within the Redevelopment Authority that assists local businesses in their pursuit of sustainability measures through technical assistance and resources. This effort, launched in 2008, is currently helping 27 small- to mid-sized companies reduce energy use, water use, and waste. The Sustainable Business Leader program also has developed an innovative best practices resource that focuses on measures that businesses can undertake in areas ranging from energy to pollution prevention.

Additional Sustainability Initiatives

Boston has developed additional important sustainability initiatives that have helped improve the city. One such example is the innovative Kill-A-Watt program, where the city provides residents with an energy reduction device that measures the amount of energy different household appliances consume. The Kill-A-Watt program is offered as a free rental from the city's libraries. Boston residents can connect household appliances to the Kill-A-Watt and then track those appliances' electricity usage and make changes accordingly. As the U.S. Department of Energy has estimated that approximately 10 percent of electricity used in the home is from idle devices utilizing electricity, known as 'phantom' electricity usage, this program creates the opportunity to reduce energy usage and save residents money.

The city also has encouraged increased solar electricity production through the Solar Boston program. The primary goal of this policy is to increase solar energy use in Boston to 25 megawatts (MW) by 2015. Boston was one of the original 13 cities to sign on under the Solar America Initiative run by the U.S. Department of Energy. The program encourages solar adoption widely throughout the city, such as by mapping locations for solar installations and preparing and planning,

by working with local organizations to maximize the city's usage of state incentives, and by creating a non-profit to implement long-term goals. Solar Boston also has worked with the Boston Redevelopment Authority to create an interactive map, which shows active solar installations in the city and calculates building rooftop solar potential. The city has done an excellent job of incorporating a number of initiatives into its overall plan for a greener future, ensuring future gains for sustainability in Boston and the state of Massachusetts.

Statewide Initiatives

Massachusetts is a sustainability leader in the Northeast on many issues ranging from green building to renewable energy standards. In March 2009, Governor Patrick's Zero Net Energy Buildings (ZNEB) Task Force released a set of recommendations, which will help Massachusetts commercial and residential sectors move toward zero net energy construction by 2030.

A LEED Plus green building standard has been adopted in the state, which means that in addition to meeting the criteria in the LEED rating system, all buildings must perform 20 percent better than the Massachusetts Energy Code, reduce outdoor water consumption by 50 percent and indoor water consumption by 20 percent, while promoting smart growth principles. Massachusetts also has adopted a significant renewable energy goal, calling for 250 MW of solar capacity by 2017 and 2,000 MW of wind power capacity by 2020.

Mike Davis also commented on the importance of cooperation between localities and states when developing "sustainable" green policies.

> *The City of Boston and Massachusetts have increased collaboration on a number of sustainability issues as a result of the 2004 Mayor's Task Force recommendations. Specifically on distributed generation, whereby the city has joined the Distributed Generation Collaborative, an industry group looking at energy use and regulatory reform, and out of that group's work came some very important sections of Massachusetts' 2008 Green Communities Act that significantly loosened the regulation of distributed generation.*
>
> *Second, the Governor's Zero Net Energy Building Task Force completed its work earlier this year, and we have already seen the first recommendation implemented: The governing body of our State's building codes, the Board of Building Regulations and Standards (BBRS), has voted to approve a 'stretch code' amendment that would allow municipalities to adopt building energy use requirements that are more stringent than the underlying building code. The Board of Scientific Affairs (BSA) Legislative Affairs Committee and COTE were very active in advocating for the stretch code.*
>
> *The significant take-away from all of this is: Zoning change is good, but building code change is better. And unilateral municipal action is good, but the influence that our cities have in state government should not be underestimated!*

Additional Resources

Boston Redevelopment Authority
http://www.bostonredevelopmentauthority.org

Zoning Code
http://www.bostonredevelopmentauthority.org/pdf/ZoningCode/Article37.pdf

Boston Green Affordable Housing
www.cityofboston.gov/dnd/D_green_housing.asp

GreenTech Boston
http://140.241.251.212/econdev/greeningboston.asp

Sustainable Business Leader
http://www.sustainablebusinessleader.org/

Zero Net Energy Buildings (ZNEB)Task Force Report:
http://www.mass.gov/Eoeea/docs/eea/press/publications/zneb_taskforce_report.pdf

Kill-A-Watt Program
http://www.cityofboston.gov/environmentalandenergy/kill-a-watt.asp

Solar Boston Map
http://gis.cityofboston.gov/solarboston/

Grand Rapids, Mich., is a leader on sustainability and green building in Michigan. The city is pursuing an aggressive initiative focused on becoming one of the greenest cities in the country. The entrepreneurial culture of the city's business community and forward-looking local architects have led to impressive and sustainable results for the community. Long-term planning and thinking, exemplified by revisions made to the city's master plan have reinforced and laid the groundwork for what has become a model greening initiative in western Michigan and the United States.

Grand Rapids Art Museum, Grand Rapids, Mich.; architect: wHY Architecture; photo by Steve Hall@Hedrich Blessing

"We are so proud of our deep history with green building."

—Grand Rapids Mayor George Heartwell

Mayor's Initiatives

With the election of current Mayor George Heartwell in 2004, Grand Rapids found itself an executive firmly focused on sustainability and greening the city. The mayor's initiatives center on green building and green power, while educating the community on what city sustainability truly means for the environment, economy, and social benefit of Grand Rapids.

Sustainable built infrastructure has been focused on for several years, culminating in the current mandate that all new municipal construction and major renovation (over 10,000 square feet and $1,000,000) meet LEED Certified standards. In leading by example and offering incentives and education to private commercial projects, Grand Rapids has seen an explosion in green building. Mayor Heartwell added, "Grand Rapids today has more LEED Certified buildings per capita than any other city in the country."

Grand Rapids Architectural and Business Community

Bob Daverman, AIA, LEED AP, senior architect, Progressive AE, poses the following question to explain the importance of the city's architectural and business community to its resounding success:

Why has Grand Rapids' infrastructure become green so quick?

The entrepreneurial culture of the city's business leaders has been fundamental to the answer. Private, family-run manufacturers, in particular the office furniture industry, saw the benefit that sustainability in general and LEED goals in particular could deliver, and set the parameters for achievement. In the late 90s, Herman Miller included William McDonough on their manufacturing facility project team. Peter Wege's Foundation (founding family to Steelcase) funded major civic projects, requiring all to be LEED Certified—The LEED Gold Grand Rapids Art Museum, for example. Their influence extended reach such that all local architects benefited early from our clients, who understood and paid for the first versions of LEED buildings. Our newspapers and business journals have kept green design in the forefront for the past decade.

Grand Rapids Art Museum, Grand Rapids, Mich.; architect: wHY Architecture; photo by Scott McDonald @Hedrich Blessing

Grand Rapids Art Museum, Grand Rapids, Mich.; architect: wHY Architecture; photo by Steve Hall@Hedrich Blessing

When Daverman is asked if the economic downturn changed Grand Rapids' position on sustainability, his response is: "Resoundingly no!"

> *Progressive has been the most active and supportive architecture firm for AIA in West Michigan for decades, much more so than firms twice its size. We have also trained many of the contractors in LEED.*

Daverman adds that architecture firms and the private sector have been making the case for many years now that holistic sustainable design is needed for the community. Mayor Heartwell has carried the torch on sustainability by offering increased incentives, and "he has done a superb job at this."

Not-for-profit groups, like Grand Action, also have worked with community stakeholders in order to identify and revitalize downtown projects. The group can count a number of important successes in its almost two decade history, in which they have galvanized the public on the importance of historic preservation and good design. Organizations like this help involve the community and reinforce the value and importance of design and sustainability.

Triple Bottom Line

The city of Grand Rapids is focusing on the "triple bottom line" when looking at sustainability policy. This is thinking that is beyond just the usual economic focus and instead takes into account social equity and environmental protection, all the while still fostering economic advancement. The city leaders know that the same business practices that make a city good to live and work in also work toward economic prosperity.

The triple bottom line dictates that the concept of environmental protection and economic profitability are not mutually exclusive. In fostering this environment, worker attraction and retention have been increased in Grand Rapids, saving both businesses and the government money. Mayor Heartwell has stated:

Any city in the nation can move quickly and distinguish itself as a center for green technology and green innovation. The challenge is trying to balance the triple bottom line and that is what we have taken on as our challenge.

In furthering sustainability efforts across Grand Rapids, the mayor has established the goal of attaining 100 percent renewable energy use for municipal structures by 2020. While setting this ambitious goal, city structures have reduced their energy consumption by 10 percent to date, setting an example for commercial and residential projects. By 2007, city structures were already using 20 percent renewable energy, a year sooner than projected, receiving significant community praise.

Community Sustainability Partnership

In August 2005, the Community Sustainability Partnership (CSP) was founded by the City of Grand Rapids, in cooperation with four local higher learning institutions. In less than four years, the CSP has grown to incorporate 175 local businesses, organizations, and individuals who have embraced local sustainability in their business models, planning, and operations.

With annual meetings to train and educate individuals on sustainable practices, and triple bottom line thinking, the CSP has strived to extend its reach and impact within Grand Rapids. The CSP has even influenced other regional cities, such as Kalamazoo, Muskegon, and Holland/Zeeland, to create their own partnerships. These examples of regional knowledge sharing lead to increased levels of green building and the furtherance of sustainable practices in communities that may not have been as easily reached had it not been for leaders like Grand Rapids. This city has proven itself to be the sustainability leader in the region over the years and is continuing to blaze new trails on green building.

Regional Center of Expertise

Grand Rapids has taken steps to secure its economic and environmental sustainability. This foundation is being augmented and sustained through its schools and higher learning institutions, which are laying the groundwork for long-term leadership. The city is the first in the United States to be recognized by the United Nations University as a Regional Centre of Expertise (RCE) in the area of sustainability in built infrastructure. Sustainable infrastructure and urban growth are the main objectives of the RCE, along with environmental protection, transportation infrastructure renovation, and the creation of green jobs in and around Grand Rapids.

With a healthy mix of urban, suburban, and rural communities, the lessons learned in Grand Rapids can be implemented in other parts of the Great Lakes region, and the entire country. The regional lessons are extremely important as green building differs widely throughout the country depending on climate variations. Innovative ideas created by cities such as Grand Rapids, Minneapolis, and Chicago can greatly help the entire region as the Great Lakes region becomes greener. And, by partnering with higher learning institutions, the city of Grand Rapids is guaranteeing that future graduates will have the training and experience necessary to further sustainable design efforts within the region. Long-term objectives for the RCE include measurable improvements in the triple bottom line achievements of a healthy economy, environment, and social capital; institutionalized sustainable development education programs at K-12 and higher learning levels; and increased public understanding of the RCE's efforts within the community.

Green Schools

In May 2009, the Grand Rapids Public School District (GRPS) received its third LEED certification for a school structure. The Gerald R. Ford Middle School attains this classification through a number of green design features, such as low emitting paints, carpet and wood; large daylight windows to reduce the need for artificial light sources; occupancy sensors designed to turn off lights in unoccupied rooms; and a state of the art cooling and heating system designed for maximum efficiency.

Other green schools in the community feature many innovative green features. West Catholic High School features a 40,000 square foot LEED Certified gymnasium. At Burton Elementary and Middle School they

have created a Roof Rain Garden. All of these projects have the aim of reducing energy and water use, providing improved air quality for students, and helping to lower overall operating costs.

Statewide Initiatives

The state of Michigan has had building sustainability on its agenda since 2002. It consistently performs energy audits on its existing state buildings, and creates new buildings to green design specifications. On Earth Day 2005, Governor Granholm signed an executive directive to target reductions in the state's energy costs, concentrating on built infrastructure energy use by requiring that LEED standards be met by most state and publicly funded structures. As of September 2008, the state of Michigan had completed 272 LEED registered projects, of which 79 gained certification.

Grand Rapids, through partnerships with the architectural and business community, has emerged as a leader in American green building. With strong leadership from the city's mayor and innovative, long-term thinking ingrained in the community, the future of sustainability in western Michigan looks promising.

Additional Resources

Grand Rapids Sustainability Official Page
http://www.sustainablegr.com/

Community Sustainability Partnership
http://www.grpartners.org/index.php

Wege Foundation
http://wegefoundation.com/index.html

Grand Action
http://www.grandaction.org

LEED Certified projects in greater Grand Rapids
http://www.usgbcwm.org/leed/area-leed-project-showcase

Green Building in Michigan
http://www.michigan.gov/deq/0,1607,7-135-3585_4127_24843-125051--,00.html

Philadelphia is the sixth-largest city in the United States and a consummate leader on green building in the state of Pennsylvania. As the cradle of American democracy, the city's history and well-defined walkable, urban neighborhoods prepare it to be a 21st century leader on sustainability. Philadelphia Mayor Michael Nutter has challenged the city to become the "greenest city in America" and is moving forward on a number of fronts, with notable successes, including Philadelphia having the tallest green office building in the nation and the second-highest level of green roof space in the country.

Philadelphia Forensic Science Center, Philadelphia; architect: Croxton Collaborative Architects PC; photo by Halkin Photography LLC

Philadelphia Forensic Science Center, Philadelphia; architect: Croxton Collaborative Architects PC; photo by Halkin Photography LLC

Mayor's Office of Sustainability

Mayor Nutter's sustainability plan includes multiple facets, with green building being one of the primary components. The four key areas within the Office of Sustainability are Energy Conservation Initiatives, the Solar City Partnership, Green Buildings, and Partnerships with External Organizations.

The Office of Sustainability seeks to work with city agencies, a sustainability advisory board, and external organizations to create long-term sustainable achievements in Philadelphia. At the same time, this office works to improve municipal energy efficiency and reduce operational costs. City governments must lead by example in order to enact positive change in communities, and Philadelphia is doing this through the mayor's Office of Sustainability.

Green Building Requirements

A *High Performance Building Renovation Guide* was completed in 2004, which city staff uses to guide municipal renovation projects. The primary goal with renovation projects is to achieve design improvements that address energy conservation, storm-water management, recycling, waste reduction, and indoor air quality. The guide also assists in the city's focus on alternative energy sources, climate protection, and advanced building systems and controls.

There is currently discussion in the city about whether the 10-year tax abatement offered for all new development should be focused specifically on green building. The Planning Commission is considering promoting this tax abatement more toward green projects. Philadelphia's green building plan incorporates a focus on attracting new business and keeping current business and residents in the city proper. While there is ongoing debate over the future of incentives and green building standards in the city, Philadelphia is pushing ahead with important green building projects, including a Youth Detention/Study Facility, Water Department buildings, and a new Airport Terminal project. The greening of affordable housing is also being explored as a significant focus of the overall green building plan.

The city plans to use money from the Energy Efficiency and Conservation Block Grant funding to bolster green building and green jobs. When the AIA contacted the city, it was in the process of hiring consultants and internal teams were deciding how exactly to spend the money, but officials reported that the two primary focus areas are to support green building and fund public housing projects that will meet Energy Star standards.

Greenworks Philadelphia

The mayor has set the goal of becoming the "greenest city in America." The question is: "How does the city of Philadelphia achieve this goal?" The Greenworks Philadelphia plan is the answer. This plan builds on the Local Action Plan for Climate Change that was developed by the Sustainability Working Group in 2007, which set a goal of a 10 percent greenhouse gas reduction by 2010. Now with the new Greenworks plan, the goals and aspirations have been broadened and made more all-encompassing by examining sustainability through five lenses: energy, environment, equity, economy, and engagement. Measurable goals have been set for each area with targets to be reached by 2015.

Fifteen targets have been developed in order to implement the goals in each of the five lenses. The goal's identified in the energy section make Philadelphia reduce its vulnerability to rising energy prices:

1. Lower city government energy consumption by 30 percent
2. Reduce citywide building energy consumption by 10 percent
3. Retrofit 15 percent of housing stock with insulation, air sealing, and cool roofs
4. Purchase and generate 20 percent of electricity used in Philadelphia from alternative energy sources

The environment section's goals are to reduce the city's environmental footprint:

5. Reduce greenhouse gas emissions by 20 percent
6. Improve air quality toward attainment of federal standards
7. Divert 70 percent of solid waste from landfills

The goals of the equity section is for Philadelphia to deliver more equitable access to healthy neighborhoods:

8. Manage stormwater to meet federal standards
9. Provide parks and recreation resources within 10 minutes of 75 percent of residents
10. Bring local food within 10 minutes of 75 percent of residents
11. Increase tree coverage toward 30 percent in all neighborhoods in 2025

The economy section has as its goal for Philadelphia to create a competitive advantage from sustainability, and there are three targets identified:

12. Reduce vehicle miles traveled by 10 percent
13. Increase the state of good repair in resilient infrastructure
14. Double the number of low- and high-skill green jobs

Finally, the engagement section has one goal, tying together the preceding 14 goals, which is for Philadelphians to unite and build a sustainable future with the target of making Philadelphia the greenest city in America.

Director of Sustainability Katherine Gajewski is excited with the progress the city has made with the program, and its prospects for the future. With Greenworks Philadelphia, the city has a full menu of initiatives that build on the sustainability experience, resources, and commitments we already have, and point us toward where we as a city government and community need to be.

Greenworks Philadelphia has been timely. It has given us a ready source of 'shovel ready' projects for a number of recovery programs, including the EECBG, as well as progressive programs launched by the Commonwealth of Pennsylvania.

We know and welcome the fact that more aggressive 'green' building codes are coming, and we're getting ready.

Philadelphia is gearing up to adopt the latest ICC codes and promote high rates of compliance. At the same time, we are developing 'above code guidelines' to make green building easier and promote integrated design and high-performance structures.

Green Jobs

The integration of sustainability into economic development goals is an important aspect of the Philadelphia Greenworks plan. Green jobs, in particular, are focused on with a target of creating more than 10,000 new green collar jobs in the city by 2015. With federal Recovery Act dollars flowing into communities throughout the country, Mayor Nutter's administration sees key areas for job creation in weatherization, lowering greenhouse gas emissions, increasing rates of recycling, and increased production of local food. These goals, as part of the wider Greenworks Philadelphia plan, will improve progress toward the economic development goals of the city and create jobs.

Public-private partnerships work exceptionally well to promote green jobs in communities. One such successful program is the Pennsylvania Horticultural Society's "City Harvest." This program has been funded through a grant from the Albert M. Greenfield Foundation, and developed with the Philadelphia Prison System; SHARE, a food distribution network; and the Health Promotion Council of Southeastern Pennsylvania. The purpose of the "City Harvest" program is to raise and distribute local, naturally grown vegetables to those residents who otherwise would be unable to purchase or find fresh produce. In the program, Philadelphia inmates grow seeds into saplings and then a combination of prisoners and volunteer gardeners grow these saplings and harvest and distribute the resulting vegetables. This type of program is doubly important for the skills and value it provides to the prisoners, as well as the benefit it provides to Philadelphia residents.

Statewide Initiatives

The Governor's Green Government Council was created in 1998 to assist the state government in establishing environmentally sustainable policies. The council works with state agencies on a variety of sustainability policies in planning, policymaking, and regulatory operations. Every year on September 1 the council presents a report to the governor on the year's green activities. High-performance, green building has been a long-standing priority for the group, and Maureen Guttman, AIA, as executive director has been a tireless advocate of the benefits of green building for the state.

The state is also providing money to localities for green building and two separate House bills have passed that will fund alternative energy and energy-efficiency programs. Pennsylvania is going to meet the 2009 standards of the International Code Council, and Recovery Act funds are going to be used to educate and train the public on the standards that are put in place in the state.

Additional Sustainability Initiatives

SustainLane ranked Philadelphia as the eighth most environmentally friendly city in 2008. The city has focused on multiple fronts beyond green buildings to create a holistic, sustainable community. Programs, including innovative alternative energy generation projects for public agencies, hybrid/clean diesel buses, and the solar city partnership, are helping the city move toward its goal of becoming the greenest city in America.

Alternative energy generation projects, such as a solar water heating system that was installed in the Riverside Correctional Facility, illustrate how the city's Office of Sustainability works with individual agencies and across agencies to implement projects that examine life cycle costs, as well as up-front costs. Philadelphia is replacing buses in the city with hybrid/clean diesel buses, and will have 60 percent of the system replaced by 2011. The hybrid/clean diesel buses are nearly one-third more fuel-efficient than standard diesel buses, and the city is taking additional steps to make the existing non-hybrid buses more environmentally friendly, by retrofitting the entire bus fleet to operate on cleaner fuel.

Green roofs are also being installed throughout the city, with notable examples such as the PECO Energy Company headquarters and the Central Branch of the Philadelphia Free Library. PECO has installed a 45,000 square feet living roof on its headquarters building, which will absorb 60 percent to 70 percent

of the rain water annually, with runoff reduction rates ranging from 50 percent to 85 percent depending on the time of year. Finally, the Central Branch of the Philadelphia Free Library is an exemplar of municipal design, standing as the largest public building in Pennsylvania with green roof technology.

These additional initiatives coupled with the city's focus on green building make it well-prepared to be a leader on sustainability for years to come. Long-term planning and thinking are two values that create well-run, resilient sustainability programs, and Philadelphia leaders, architects, and citizens are working together to reach the goal of creating the greenest city in America.

AIA Involvement

A. Stevens Krug, AIA, PE, CEM, LEED AP, president/COO Spiezle Architectural Group, and AIA Pennsylvania President Elect commented on the green building efforts in Philadelphia:

> *Philadelphia's Mayor, Michael Nutter, initiated a broad and systemic plan to make Philadelphia America's Number One Green City—"Greenworks Philadelphia." This plan has the support of the local architectural and building community. An architect and former AIA Philadelphia President, Alan Greenberger, now serves as the acting Deputy Mayor for Planning and Economic Development and Commerce Director. AIA members have recently completed a Philadelphia Rowhouse Manual, available in the AIA Bookstore, that shares important sustainability lessons for all Philadelphians. And, currently the planning and zoning codes are undergoing a broad overhaul, to which the local AIA chapter has contributed. These will make our building regulations sustainable and make our vision of the future a green one.*

Additional Resources

Mayor's Office of Sustainability
http://www.phila.gov/green/mos.html

Greenworks Plan
http://www.phila.gov/green/greenworks/index.html

Philadelphia Forensic Science Center, Philadelphia,; architect: Croxton Collaborative Architects PC; photo by Halkin Photography LLC

Philadelphia High Performance Building Renovation Guide
http://www.phila.gov/pdfs/PhiladelphiaGreenGuidelines.pdf

Jobs@the Heart of Nutter Plan
http://www.philly.com/philly/news/homepage/20090429_Jobs_are_the_heart_of_Nutter_s_sustainability_plan.html

Philadelphia's Green City Harvest Program
http://www.pennsylvaniahorticulturalsociety.org/phlgreen/city-harvest.html

Governor's Green Government Council
http://www.gggc.state.pa.us/gggc/cwp/view.asp?a=515&q=156866

Nashville has long been known as the country music capital of the world, and is now also being acknowledged for its' innovative community planning and sustainability efforts. In the last few years the city has begun to assert itself as a green building leader in the southeast by passing a green building law, working jointly with the state on sustainability efforts, and helping to revitalize an aging neighborhood into a green community. The city's sustainability efforts provide a model of leadership for Tennessee and the wider southeast, and Mayor Dean is seeking to make Nashville the "greenest city" in the south.

The Gulch, Nashville; architect: Looney Ricks Kiss Architects, Inc.; photo by MarketStreet Enterprises

Green Building Requirements

Since 2007, Nashville has required LEED certification for city owned buildings, by designing all new and renovated structures to green standards. All municipal facilities that cost more than $2 million or are larger than 5,000 square feet of occupied space must pursue LEED Silver certification. Originally, the Metro Public Schools, Metro Development and Housing Authority, and Metro Transit Authority were exempted from these green requirements, but all since have been amended back into the legislation.

Mayor's Agenda

Nashville has a formidable track record of electing mayors who take city sustainability seriously. Beginning in 1991, Mayor (and now Governor) Phil Bredesen introduced the Greenways Commission, which is aimed at planning and developing green initiatives throughout Nashville and Davidson County. This program developed into Greenways for Nashville, a nonprofit, which continues to enhance environmental opportunities in the community.

In 2007, then Mayor Bill Purcell signed the Green Building Ordinance, which represented a significant step forward in the way Nashville approached sustainability. This has been carried forward by current Mayor Karl Dean, who on June 19, 2008, issued Executive Order No. 33. This order created a panel of regional experts called the Green Ribbon Committee. This committee is located in the Office of the Mayor and is tasked with identifying goals and developing the plan that will make Nashville the undisputed greenest city in the South.

State Initiatives

Governor Bredesen created the State Energy Task Force in March 2008, with the goal of increasing energy-waste awareness statewide. Energy prices are relatively low in Tennessee, and the impact of energy waste is not felt as widely as in many other states. Therefore, energy use reductions in municipal buildings, as well as in commercial and residential buildings, have not always been prioritized.

In December 2008, Governor Bredesen signed Executive Order No. 59, which focuses on energy use in the state and requires the use of Energy Star qualified equipment in state government offices. The state is leading by example with this initiative, and local governments in the state have responded positively to this change.

Urban Development

With its proximity to Nashville's downtown business district, The Gulch neighborhood's LEED Silver for Neighborhood Development (ND) status is a fitting honor for the city's expanding revitalization program. Ten years in the making, the project was the brainchild of MarketStreet Enterprises, who worked hand in hand with the city and county governments to create a dynamic downtown district worthy of international recognition. The Gulch was only the 13th neighborhood in the world to be recognized as LEED ND by the USGBC, joining prestigious projects such as the Beijing Olympic Village.

R. Hunter Gee, AIA, of Looney Ricks Kiss Architects, Inc., was part of the design team working on The Gulch.

> *Conceived long before the LEED ND program was developed, LRK along with The Gulch developers envisioned a compact, walkable, mixed-use neighborhood that Nashville never had. In its 10 years of development, The Gulch has demonstrated a significant demand for urban living in the Nashville market and has led our downtown residential renaissance. Nashville's leadership over the past decade has recognized the importance of building more 'sustainably' and has supported projects such as The Gulch through policy and code adjustments and financial incentives that encourage the development community to go green.*

For The Gulch to evolve from a derelict neighborhood peppered with brownfield sites and old contaminated storage tanks to a thriving economically and environmentally sustainable community is impressive. The city invested $7 million to upgrade water and sewage infrastructure, as well as the streetscape, helping to move this sustainable neighborhood forward. This city

and county investment literally paved the way for MarketStreet to commence building and bring corporate investment along with an increasing number of multifamily lofts. Growth continues today, with millions of dollars in building still scheduled for completion.

Economic Sustainability

Another growing force in the shaping of downtown Nashville is found in the Nashville Downtown Partnership, a corporate nonprofit seeking "to make Downtown Nashville the compelling urban center in the Southeast in which to live, work, play and invest." The group has been operating since 1994, and has hosted thousands of meetings for local developers, tenants, investors, and the press. NDP can now boast 50 contributing companies and foundations, dedicating their support for anywhere from a single donation to 3-year pledges. In working to make it easier for developers to build and residents to move to downtown Nashville, the NDP has facilitated significant urban core growth.

Green Schools

Nashville's universities have set the sustainability standard for educational institutions in the Southeast, pursuing large-scale green projects and teaching advanced sustainability practices. Vanderbilt University has designed their latest building project to LEED Gold standards, building seven individual buildings that make up "The Commons." It is the largest collection of LEED certified buildings on one college campus. The Commons was designed and built by a collaboration of Nashville-based architects and construction companies, using 26.4 percent recycled materials, diverting more than 74 percent of demolition waste from landfills, and purchasing more than 50 percent of the building materials locally.

Lipscomb University has formed the Institute for Sustainable Practice, aiming to develop young minds into the sustainability practitioners of the future. The emerging sustainability industry is a major opportunity for cities and counties to create jobs, and Lipscomb in Nashville recognizes the importance of preparing students to meet the job requirements of the 21st century. Academic programs are available in undergraduate and graduate degree tracks, and feature majors in Sustainability Practice, Environmental Science, and a sustainability concentration within the University's MBA program.

Other Initiatives

Nashville has been encouraging its citizens to go green in many ways, beyond its green building policy. The city has strong initiatives in place to improve the water infrastructure and encourage biking and walking in the revitalized urban core.

The Clean Water Infrastructure Program (CWIP) passed by the city council in 2009, updates and revitalizes Nashville's water supply infrastructure since 60 percent is more than 40 years old. The strain on this system is immense, as Nashville continues to grow and the demand for water increases. Through a small rate increase for customers, amounting to around $3.00 for the average consumer, $500 million will be spent on improvements over the next five years, which will result in increased cleanliness, efficiency, and lowered overall rates in the future.

With the increased urban revitalization seen in downtown Nashville, the city is mounting a campaign to increase bicycle and pedestrian traffic to achieve some very specific, precise goals. By increasing the attractiveness of the city to bicyclists and pedestrians, the local economy, environment, and quality of life is set to improve significantly, as businesses increasingly flock to the city and the daily output of CO_2 steadily decreases. The creation of the Bicycle and Pedestrian Advisory Committee (BPAC) will better serve the interests of bicyclists and pedestrians in future downtown infrastructure and streetscape plans.

It is not only the government that is looking to lead by example in reducing the city's carbon footprint. Nashville's Thomas Nelson Publishers is one of the leading publishers of Bibles and other Christian books. Paper consumption is a major issue for the company, so an initiative has begun to reduce their paper consumption by 30 percent before 2012. The firm also is being more discriminating in the source of their paper, working to eliminate the use of trees that are endangered or part

The Gulch, Nashville; architect: Looney Ricks Kiss Architects, Inc.; photo by MarketStreet Enterprises

of "old growth" forest areas. Beyond the education of employees and customers on the importance of sustainability, Thomas Nelson Publishers also is working with its suppliers to create their own corporate "greening" plans.

Future Goals

Mayor Dean has established that the goal of his Green Ribbon Committee is for the city to lead by example in Nashville. The committee has reinforced this notion by releasing its June 2009 report, outlining 16 goals and 71 recommendations for the future. These goals and recommendations are broken down into "Quick Wins," "Mid-Range," and "Long-Term" initiatives. This mix of initiatives suggests that the city is looking to ensure that the greening of Nashville is accomplished in an orderly, steady manner. The plan calls for an overarching focus on creating green jobs, offering sustainability education, establishing a government agency specifically focused on the environment and sustainability, creating a green business roundtable, and instituting an environmentally friendly, preferred-purchasing program for all government institutions. These measures will continue to help Nashville realize its goal of being recognized as the greenest city in the Southeast.

Additional Resources

June 2009 Green Ribbon Committee Report
http://www.nashville.gov/mayor/green_ribbon

Greener Nashville, Sustainability Info
for Middle Tennessee
http://www.greenernashville.org/

Bicycle and Pedestrian Advisory Committee
http://www.nashville.gov/mayor/bpac/index.asp

Clean Water Infrastructure Program
http://www.nashville.gov/water/cwip/