

Mayor Menino's
Green Building Task Force Report
Executive Summary
Fall 2004

everyone benefits from green building...



MAYOR THOMAS M. MENINO



BOSTON GREEN
BUILDING



everyone.

The Green Building Task Force was convened by Thomas M. Menino, Mayor of Boston, to explore the subject of green building and to recommend actions through which the City of Boston can most effectively foster an increase in green building and become a national leader in this field.

The membership of The Mayor's Green Building Task Force included highly knowledgeable and experienced professionals in every field related to the financing, design, construction, management, and maintenance of buildings. This broad composition has given the Task Force a uniquely comprehensive set of disciplinary expertise and perspectives, allowing the group to consider the myriad opportunities and challenges of high performance green building through a variety of lenses and from a number of different angles.

Meeting monthly for one year, the Task Force began by surveying green building programs nationwide to help establish goals and benchmarks, then proceeded to engage in seven issue-focused meetings. Those meeting topics were:

- Education, Awareness, and Training
- Building a Green Team
- Capital and Operating Finance
- Incentives
- Sustainable Planning and Leadership
- Economic/Business Development
- Standards, Measurement, and Verification

Additionally, members of the Task Force participated in special discussions with experts from around the country and traveled to Chicago and Seattle to learn from green building professionals in those cities.



Green building is just good building: a letter from Mayor Menino

Dear Friends:

I am pleased to share with you this Executive Summary of my Green Building Task Force Report. It provides great insight into ways that all of us can capitalize on opportunities to create cost savings by improving the energy efficiency and performance levels of newly constructed facilities, rehabilitated structures, and private homes.

Like any homeowner or business decision-maker, I must manage costs and find ways to get the absolute maximum value out of each dollar I spend. The George Robert White Nature Center—Boston’s first municipal green building—achieved both of these goals. The building’s use of a broad range of materials, technologies and green building strategies will produce energy cost savings and improved health without the negative environmental impacts of conventional construction.

I launched this Task Force to help others understand and attain the same benefits. Approaching our building projects with an eye for maximizing performance and minimizing environmental impacts is full of potential gains for all of us—and the dividends will only increase as the cost of materials and energy continues to rise.

While the subject is indeed complex, the central facts are simple. High performance green building is just a fancy description for good building. It is good for your wallet. It is good for the environment. And it is good for people.

I thank the members of this Task Force for their dedication to this important subject, and I ask all Bostonians to join with us in incorporating green building methods and technologies into your building projects. My administration will support you in this endeavor. And we will all reap the benefits.

Sincerely,

A handwritten signature in black ink that reads "Thomas M. Menino". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

Thomas M. Menino
Mayor of Boston

“High performance green building is good for your wallet. It is good for the environment. And it is good for people.” – Mayor Thomas M. Menino

Mayor's Green Building Task Force

Task Force Chair

Joy Conway, Living Cities: The National
Community Development Initiative

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Daniel St. Clair, Spaulding & Slye Colliers / Boston

Kirk Sykes, AIA, The Primary Group

Kathy West, Partners Health Care System, Inc.

Tatiana Xenelis, Massachusetts Housing Partnership

Working together to reap rewards: a letter from Joy Conway, Task Force Chair

Dear Mayor Menino:

On behalf of the members of your Green Building Task Force, I thank you for your leadership in creating this collaborative working group. I am grateful to my fellow Task Force members for their dedication to this important subject, and to the Massachusetts Technology Collaborative and an anonymous foundation for funding and supporting the Task Force's efforts.

As a real estate professional for more than 30 years, I am familiar with the challenges the industry faces. Green building can solve or alleviate many of these challenges, offering cost savings, energy efficiencies, decreased environmental impacts, and contributions to overall health and productivity. These sources of added value are available to all—from real estate developers to owners of property portfolios, from individual homeowners to large institutions.

Given that the building industry is the nation's largest manufacturing activity, representing more than 50 percent of the nation's wealth and 13 percent of the Gross Domestic Product, its continued robustness is critical to our overall economic vitality. At the same time, buildings draw heavily on the earth's resources. Directly and indirectly, buildings consume approximately 40 percent of all energy used in the U.S., and the construction industry produces up to 40 percent of the material that goes into our landfills.

With experts and major stakeholders in every area of real estate development, finance, and management, this Task Force has provided a uniquely comprehensive examination of every facet of green building. We, the Task Force members, encourage the City of Boston to be bold in incorporating the lessons we have learned and the recommendations we have formulated. Simply put, the stakes are astronomical. We look forward to working with you to achieve our shared goals.

Sincerely,



Joy Conway, Chair

“Green building offers cost savings, energy efficiencies, decreased environmental impacts, and it contributes to overall health and productivity.” –Joy Conway, Task Force Chair



Boston benefits.

High Performance Homes

Residential projects, ranging from the renovation and construction of individual homes to historic rehabilitation and large-scale, new construction, collectively make up much of Boston's overall building activity. Boston's existing green residential projects offer compelling arguments for other residential projects to get green.

Erie Ellington Homes, pictured here, is a new 50-unit, wood frame affordable housing development located in Dorchester. Through the team's unique systems approach, these energy-efficient high quality buildings were completed at an astonishingly low \$97 per square foot—or roughly 25% below typical area costs.

After a year and a half of operation, actual data from occupants' utility bills make the case for greening Boston's residences. Compared to a base case building conforming to the Massachusetts building code, the typical Erie Ellington home used 42% less space-heating energy, 27% less domestic water-heating energy, 40% less water, and 59% less electricity. Also, the homes emitted 50% fewer air pollutants than comparable conventional homes.

The dramatic increase in utility prices within the past five years makes these savings even more important to the owners. Within that period, gas prices increased by 45%, electric prices by 102%, and water prices by 38%. This means that on a dollar cost comparison basis, Erie Ellington homeowners paid: 62% less for space heating, 42% less for domestic water heating, 75% less for electrical use, and 9% less for water consumption.

Located in East Boston, the Maverick Gardens Housing development is a Boston Housing Authority (BHA) project currently under construction. The BHA expects to save \$100,000 per year (at current energy costs). The new homes incorporate photovoltaic panels, a gas absorption chiller, on-site generation, fiberglass windows, insulation, and energy efficient lighting and motors. They have received the federal government's Energy Star rating, and the BHA expects that when completed, the homes will be LEED certified.

Individual homeowners also can gain all the benefits offered by high performance green building. Amy and Jeff Trueblood of West Roxbury installed solar panels in their home in the spring of 2003. One year later, using hard numbers, the Truebloods calculated that the energy produced by these panels resulted in a 60% reduction in their annual electric bill.

Benefits of Green Building

Green building is a broad concept that encompasses ways of designing, constructing, and maintaining buildings to decrease energy and water usage and costs, improve the efficiency and longevity of building systems, and decrease the burdens that buildings impose on the environment and public health.

Green building helps reduce unnecessary capital and operating costs by taking advantage of passive strategies and optimizing integration of building systems. High performance green buildings are tailored to the local climate and site conditions in order to use materials more efficiently while enhancing quality of life.

Many different building materials and components can green a facility, and not all components are suitable for every structure. The successful Boston green buildings outlined on these pages display the wide variety of green approaches, processes, and materials.

The U.S. Green Building Council has introduced the LEED (Leadership in Energy and Environmental Design) Green Building Rating System® to designate facilities' respective levels of performance and environmental excellence. LEED serves as a national standard for developing high performance, sustainable buildings.

High performance green building benefits a wide range of individuals and groups, from homeowners to corporations, from schoolchildren to non-profit administrators, from renters of apartments to owners and managers of property portfolios.

It's good for your bottom line

High performance green buildings create a range of cost reductions, including lowered energy bills. Green buildings' "right-sized" systems are smaller and more efficient, and they last longer and perform better over time, requiring less maintenance and limiting related expenses. This means that a family renting an apartment in the Erie Ellington housing development saves money on electricity and water. It means that Manulife Financial reduces operations costs at its new U.S. Headquarters in South Boston. It means that an educational organization such as Artists For Humanity can be more confident about its future survival at its new building, the EpiCenter.

Boston's seasonal weather cycles increase the demands of heating and cooling the city's structures. Green building offers solutions, lowering energy use and increasing clean energy generated onsite. As energy costs continue to rise, the ability of Boston-based corporate facilities and property managers to reduce heating and cooling costs will become increasingly critical to their ability to remain competitive with businesses located in areas with more mild climates.

The new green facility at the The Gilman Ordway Campus of the Woods Hole Research Center in Falmouth, MA has reduced its energy consumption by an incredible 73% compared to the organization's previous building.

It helps to manage global energy demands

In today's highly challenging energy context, green building presents opportunities both to decrease energy consumption and to create energy with technologies such as wind turbines and photovoltaic arrays. Decreasing our dependence on finite energy sources, such as foreign oil, is a path to increased stability and security. This is true nationally, and it is true for families and for organizations. California's 2002 rolling blackouts offer an example of an instance in which green buildings equipped to use renewable energy would have stabilized productivity for their occupants—whether they were business people, students, medical patients, or residents. Reducing demand for energy produced by using fossil fuels also decreases the adverse effects of air pollution on the environment and on public health.

The Gilman Ordway Campus of the Woods Hole Research Center in Falmouth has been tracking its building performance data since its opening in February 2003, and has found that the new green facility has reduced its energy consumption by an incredible 73% compared to the organization's previous building.

It creates jobs and business opportunities

High performance green building offers direct and indirect benefits to Boston's economy. Job creation is a tangible offshoot of Boston's increasing green building activity, as the city will attract businesses that offer green building services—increasing the number of workers with the design, engineering, construction, and materials manufacturing skills to meet demand. Indirectly, as Boston becomes a leader in the field, this leadership will reinforce the city's brand as a home to highly skilled workers and a forward-thinking population of residents and business people.

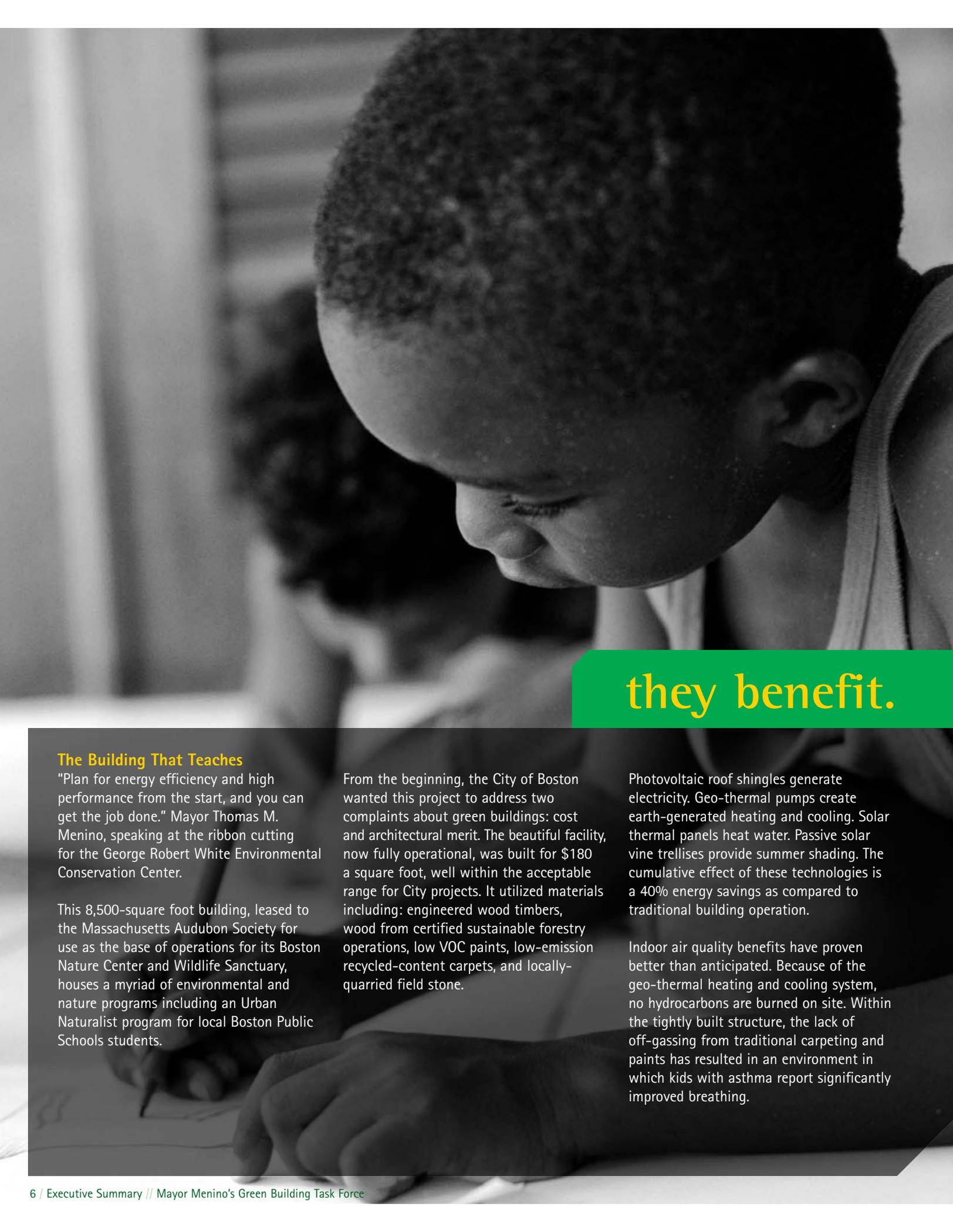
It helps you compete for employees—and for business

Both statistical data and anecdotal evidence indicate that high performance green buildings strengthen occupant companies' ability to recruit and retain employees. Buildings with improved air quality, with increased amounts of natural light, with better circulated heat and air conditioning are more pleasant, healthier and more productive places to be.

Also, green buildings contribute to the health of those who work in them. People who live and work in green facilities appear to use fewer sick days. These benefits apply to all types of buildings, including individual homes, hospitals, schools, and other facilities. In business environments, companies may also benefit from potential savings on employee health insurance costs, increasing the profitability of green buildings and recasting them as a crucial survival element for small businesses—which provide the highest number of jobs in Boston.



Designed and constructed at modest cost by Boston non-profit Artists For Humanity, the EpiCenter minimizes energy consumption and increases energy production. The building's design includes a recovery system to redistribute excess heat from manufacturing spaces, grouped computer terminals and other heat-radiating sources. The facility also features a water reclamation system for on-site reuse.



they benefit.

The Building That Teaches

"Plan for energy efficiency and high performance from the start, and you can get the job done." Mayor Thomas M. Menino, speaking at the ribbon cutting for the George Robert White Environmental Conservation Center.

This 8,500-square foot building, leased to the Massachusetts Audubon Society for use as the base of operations for its Boston Nature Center and Wildlife Sanctuary, houses a myriad of environmental and nature programs including an Urban Naturalist program for local Boston Public Schools students.

From the beginning, the City of Boston wanted this project to address two complaints about green buildings: cost and architectural merit. The beautiful facility, now fully operational, was built for \$180 a square foot, well within the acceptable range for City projects. It utilized materials including: engineered wood timbers, wood from certified sustainable forestry operations, low VOC paints, low-emission recycled-content carpets, and locally-quarried field stone.

Photovoltaic roof shingles generate electricity. Geo-thermal pumps create earth-generated heating and cooling. Solar thermal panels heat water. Passive solar vine trellises provide summer shading. The cumulative effect of these technologies is a 40% energy savings as compared to traditional building operation.

Indoor air quality benefits have proven better than anticipated. Because of the geo-thermal heating and cooling system, no hydrocarbons are burned on site. Within the tightly built structure, the lack of off-gassing from traditional carpeting and paints has resulted in an environment in which kids with asthma report significantly improved breathing.

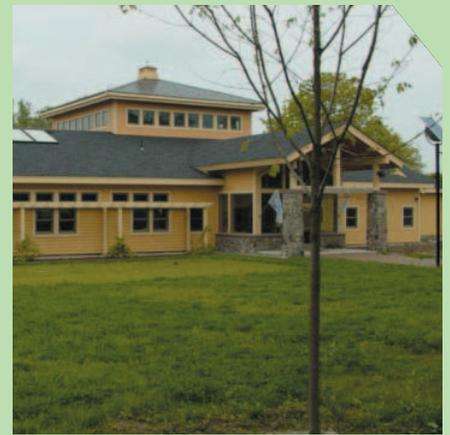
Finally, as more green buildings are developed, data has begun to demonstrate decisively that high performance green buildings spur increases in productivity among their occupants. For example, students in day-lit schools in North Carolina consistently score higher on tests than students in schools using conventional artificial lighting fixtures. Coupled with anecdotal evidence, such data suggest that green buildings' human occupants—healthy workers, students, patients, and residents—belong in the “high performance” category.

Green building protects our air and water

According to the U.S. Department of Energy, buildings account for 49% of sulfur dioxide emissions, 35% of carbon dioxide emissions, 25% of nitrous oxide emissions, and 10% of particulate emissions—all of which damage urban air quality. Scientific data and reports by the National Center for Disease Control relate the high level of such air pollutants to the increase in cancer, heart disease, and respiratory illness among urban residents. Green buildings produce fewer air pollutants, enhancing both health and quality of life for Bostonians. Boston is already a national leader in the healthcare field and in addressing public health issues. Turning our buildings into our allies in the fields of environmental and public health is a natural next step for Boston.

Green building is good for our children's health

The George Robert White Environmental Conservation Center is gathering data on decreases in both the frequency and severity of asthma attacks among users of that facility. Eleven percent of Boston Public School students suffer from asthma. Dorchester, Roxbury and Mattapan have Boston's highest percentage of asthma hospitalization. The estimated average age of residential buildings in these neighborhoods exceeds 60 years. Thus, all three neighborhoods are good candidates for green renovations. The Boston Public Health Commission identifies increasing the number of Boston's green buildings as a major step toward reducing asthma triggers.



The George Robert White Environmental Conservation Center is the City of Boston's first municipal green building. It features photovoltaic roof shingles and a geothermal heat pump. Through its Boston Schools Initiative, the facility provides environmental education programs to 35 Boston elementary schools weekly. Photo: Willard Traub

11% of Boston Public School students suffer from asthma. Green buildings can lessen the frequency and severity of asthma attacks.

Green building in Boston: a comprehensive investigation

Mayor Menino's Green Building Task Force took a uniquely interdisciplinary and thorough approach to the challenges and opportunities of improving Boston's built environment through green building practices. The Task Force organized its inquiry into seven broad categories. The corresponding discussions, outlined below, generated recommendations that will guide Boston's policy for supporting green building. For detailed findings and recommendations, please refer to the full report of the Mayor's Green Building Task Force.

Education, Awareness, and Training

The lack of awareness about the benefits and opportunities of green building may be the single greatest challenge identified by the Task Force. Even within the real estate, design, and construction industries, green building knowledge and expertise are limited. The Task Force identified constituencies and strategies that recognize the importance of aligning Education, Awareness, and Training with specific green building actions and future City programs.

Recommendations

- Work with media partners on "How To Green" news stories for homeowners.
- Create a one page "Homeowners' Green Building Check List".
- Provide green building clinics and distribute green building information at Inspectional Services Department.
- Promote non-government green building information clearinghouses including the Green Roundtable's Green Building Resource Center.
- Train and educate City of Boston staff in green building, including the LEED rating system.
- Identify, support, and strengthen academic, professional, union labor, and industry green building education and training programs.
- Promote local best practice examples and pursue opportunities to share lessons learned.

Incentives

The underlying business case for green buildings is strong, suggesting limited need for permanent green building incentives. If Boston is to become a leader in green building, it should create incentives with sunset provisions to accelerate the adoption of green building strategies and practices, such as integrated design.

Recommendations

- Create a green building pre-development loan fund, that sunsets once practice has shifted, to help proponents offset costs associated with up-front integrated planning and design.
- Create a Green Building revolving loan fund to assist early adopters; consider Harvard model.
- File State and Federal legislation for green building tax credits.
- Revise City RFPs and NOFAs to award additional points for development teams with LEED Accredited professionals and for proposing LEED certified buildings.

Sustainable Planning and Leadership

Green building as a way of life requires long-term planning and leadership from the City, the development community, the utilities, and all those whose decision-making affects our built environment. Individuals or individual buildings won't be able to take full advantage of green strategies and techniques without a combined commitment to sustainable design and planning from the larger community.

Recommendations

- Petition the DTE / DOER and utilities to use more funds to support integrated planning and to study post-occupancy benefits.
- Develop a branding strategy for City of Boston green residential projects.
- Partner with utilities to amend existing programs and to develop new strategies and programs to better promote green building and energy efficiency.
- File legislation setting new utility interconnection standards so as to allow onsite combined heat and power generation units and distributed generation.
- Request the Boston Civic Design Commission to include sustainability design as part of its review process.
- Partner with local, state, and national building and real estate associations.

Building a Green Team

The typical building design process relies on the owner and architect to make major siting and building decisions without significant input from the engineer and builder until “the building is set.” This approach only allows the engineer and the builder to respond to established design strategies. The project team for Erie Ellington Homes in Dorchester demonstrated the value of an integrated approach by bringing together the architect, engineer, and general contractor early in the project planning to design and deliver a high performance, high quality project on time and on budget.

Recommendations

- Promote more integrated project planning and design by requiring the participation of the full project team at the initiation of the BRA Article 80 review process.
- Require integrated project planning and design when issuing City service and development RFPs.
- Establish a “Green Doctor” service program providing architectural, engineering, commissioning, and energy modeling services.
- Request that the Boston Society of Architects include a Green Building/Green Team award category.
- Create a City program to recognize successful green building projects.

Business / Economic Development

Too often, when a developer or builder sets out to construct a green building, many of the preferred building products come at a cost premium or are not reasonably available. If the City is to succeed in promoting green buildings, it is essential that the necessary materials and services be cost competitive and locally available to the market.

Recommendations

- Expand the green home improvement contracting services market.
- Focus Boston Back Streets program on expanding and attracting green building manufacturers, distributors, and service providers in Boston.
- Work with area trade and labor associations to identify new green building business opportunities, products, and markets.
- Partner with area national and independent retailers, including Home Depot, Lowe’s, Target, etc., to promote green products and increase their availability.

Capital and Operating Finance

Although green buildings can offer significant operational savings and benefits, lenders seldom consider these benefits during loan analysis. For a builder who expects to be out of the project shortly after completion, it is a challenge to justify additional up front costs, even when reductions in operating costs produce a quick payback and long term savings. Presently, with only a few green buildings completed, there is insufficient market history to demonstrate the higher value of a green building.

Recommendations

- Create a revolving loan fund to help capitalize green building projects.
- Quantify the benefits of green building and circulate case studies to lenders.
- Identify and promote green building lenders.
- Identify specific green building strategies and practices that can demonstrate return on investment.
- Promote federal and state tax-based incentives to support green building lending.

Standards, Measurement, and Verification

Clear standards are essential if Boston is going to commit to green building and to maintaining a level playing field. Also, any new standards must be carefully crafted so as not to put Boston at a competitive disadvantage. Although still evolving and not a perfect system, the U.S. Green Building Council’s LEED building rating system would allow Boston to be in the mainstream of green policies and programs.

Recommendations

- Require LEED Certifiable for City-sponsored development, including funding and land disposition.
- Commit to LEED Silver for the new construction and major renovation of City facilities.
- Require LEED Certifiable for all Article 80 projects.
- Craft a three year work plan for implementation of new standards providing for staff development, change in industry practice, and public notification.
- Look at successful models of utilizing LEED standards and RFP language, consider Massport’s LEED requirements in RFPs.
- Align existing City residential building guidelines and public health policies with “state of the art” green building standards appropriate for 1- to 4-unit residential buildings.

Today's high performance green buildings generate tangible cost savings that more than offset any increases in first costs.

Planning and building for value



Artists For Humanity's EpiCenter features Boston's largest photovoltaic array. Mounted on the building's sloped roof, these panels turn solar power into electricity to drive building operations.

People who are asked to consider green building reasonably ask, "Does it cost more?"

More than what?

More than a building project solely driven by short-term, lowest-cost decision-making? Or more than a building designed with consideration given to long-term occupancy and returns on investment, building operations and maintenance, and user demand and satisfaction?

The fact is that on any building project, proponents make decisions to increase spending in certain areas. In the case of high performance green building, higher cost choices can be weighed against their byproducts: operational cost savings and additional sources of value in other sections of a project's balance sheet.

While the perception that green buildings just plain cost more lingers, recent examinations of the full spectrum of building costs suggest that people misunderstand the opportunity costs incurred by those who do not build green. Green building is a proactive response to rising costs of materials, construction, waste removal, and energy. The long-term costs of NOT building green are substantial.

Indeed, what is most exciting about this industry today is the fact that technological advances have essentially merged the categories of high performance and green, as today's high performance green buildings generate tangible cost savings that more than offset any increases in first costs. As green knowledge and materials become more widely available, increases in first costs are shrinking and in some cases are disappearing.



she benefits.

Our High Performance Economy

Local 103 of the International Brotherhood of Electrical Workers trains all new apprentices in the installation of solar panels, hinting at the potential for job creation inherent in an increase in Boston's volume of high performance green building activity. Since starting the program, over 300 members have been trained to staff cutting-edge construction projects. These new skills both serve the electricians and enhance the city's ability to construct the type of projects that the Task Force is seeking to encourage.

Local 103's commitment to high performance green building includes the installation of 48 photovoltaic panels on its building in Dorchester. This system generates 5.4 KW per hour.

Annually, the PV panels produce about 5.4 MW/Hrs, removing some 6,000 pounds of CO2 from the air each year, and union leadership expects this system to last between twenty and thirty years. Going forward, Local 103 plans to erect a wind turbine on its property along the Southeast Expressway, allowing the organization to produce even more of its own energy.

Local 103 is a good example of an organization for which each new experience with high performance green building technologies serves to increase its enthusiasm for the rewards the field offers. Tangible, valuable rewards—reduced energy costs, increased energy independence and stability, and the creation of new jobs and new income streams for union members.

As Boston designs and builds more high performance green buildings, we expect that new businesses will form and existing businesses and organizations will adapt by expanding their capabilities, as Local 103 has done. This will lead to job creation and will open new revenue streams, whether they flow into businesses that design and manufacture high performance building components or into the offices of architectural firms and engineering consultants that specialize in these subject areas. The overall effect is potentially a major boon to Boston's economy.



Manulife Financial's new US Headquarters, located on the South Boston Waterfront, features a double-skin curtain wall system that decreases summer heat absorption and increases heat retention during the winter.

Building green pays dividends

“The Costs and Financial Benefits of Green Buildings: A Report to California’s Sustainable Building Task Force,” authored by Greg Kats and released in October 2003, compares cost and benefit data from 33 high performance green buildings nationwide. Kats finds that the average cost premium over conventional construction is less than 2%. Twelve of the buildings surveyed (nearly 40%) were constructed at standard per square foot costs with no premium for green features.

Moving beyond the issue of first costs, Kats identifies several areas where green buildings can contribute to financial benefits including, “lower energy, waste, and water costs, lower environmental and emissions costs, lower operations and maintenance costs, and savings from increased productivity and health.” He concludes that “the total financial benefits of green buildings are over ten times the average initial investment required to design and construct a green building.”

How to build green for less

Early integration of design and engineering planning reduces both hard and soft costs. Proponents must bring together all of their project’s stakeholders very early in the design and development process to express the goals of the project and integrate the thinking about each aspect of the proposed building. This approach can eliminate redundancies that are built into many standard structures, thereby decreasing both hard costs, i.e. construction costs, and soft costs such as architectural and engineering fees.

For example, the successful integration of design and engineering discussions at the outset of development planning for the City of Boston’s George Robert White Center resulted in the team’s eliminating, prior to construction, an unnecessary back up system costing \$100,000.

Manulife Financial integrated its design and engineering early in its planning for 601 Congress Street. In addition to reducing hard costs and inefficiencies in the building’s operating systems, the integrated design approach produced a project proposal so thoroughly thought-out that it sped through the Boston Redevelopment Authority’s large scale development review process.

Evolving solutions address concerns

Some Task Force members who develop buildings that they will not own or operate are concerned that, while it is they who incur any increases in first costs deriving from building green, they will not remain with the asset to reap the cost savings over time. While this issue requires further exploration, it is anticipated that as public awareness about the benefits of green building rises, increased demand will cause the market to factor a premium into its valuation of green buildings. This has already happened, for example, in the Seattle area, where in the past few years “Built Green” certified homes sold at a premium that exceeded the marginal costs incurred by building green, making these homes more profitable to develop.

Manulife’s integrated design approach produced a proposal so thorough that it sped through the BRA development review.



he benefits.

Creating corporate value

Manulife Financial's LEED certified U.S. Headquarters, located on the South Boston Waterfront, is a marvelous signature building. Here, early-stage integration of design and engineering has produced not only a highly efficient and comfortable building, but also a compelling statement of Manulife's corporate brand. The structure is a physical testament to all those intangibles that fuel Manulife's success in the competitive arena. It reflects the company's commitment to combining big picture thinking with prudent cost management practices. It speaks to the eagerness of Manulife executives to incorporate efficient processes. It says that this is a company of forward thinkers—a company that plans to be here well into the future.

Fourteen stories high and 420,000 square feet, the Manulife building is Boston's most visible example of high performance green building strategies being incorporated into a major corporate facility. Designed with full consideration of the rigors of Boston's climate, the structure features a state-of-the-art double-skin curtain wall system that decreases summer heat absorption and increases heat retention during the winter months—slashing both cooling and heating costs. Manulife's development executives foresee increasing savings as energy costs continue to rise, and they expect that these savings will heighten demand among future tenants.

The building has other high performance green features, too. An accessible, rooftop garden on the twelfth floor provides extra insulation and reduces storm-water runoff. An internal, six-story atrium, which includes a garden, optimizes natural daytime lighting. Also, with the building constructed adjacent to the MBTA's new Silver Line, it stands as a wonderful example of transit-oriented development.

In addition to reductions in costs associated with building operations, Manulife's commitment to designing a high performance green building allowed the project to move rapidly through the City's environmental review and permitting processes.



you benefit.

You have a role to play in increasing Boston's share of the benefits of green building. Whether you are a homeowner, an apartment renter, a small businessperson, or a decision-maker in your organization, your voice can contribute to increased demand for the benefits of green facilities and help to drive an increase in supply.

Developers and their clients can make the smart choice to view their projects' costs with a full valuation of green building's diminished energy usage and expenses, and of the other enhancements that green buildings offer, such as more reliable and durable building systems.

Similarly, organizations embarking on both rehabilitation and new construction projects can find a way to accurately factor in the benefits of enhanced employee recruitment and retention.

Elected officials can look at green building as a proactive response to a challenging energy context and corresponding fiscal pressures. Here is a way to serve constituents by decreasing the government's burden on the environment, increasing our energy independence, and saving taxpayers' money. Neighborhood residents need to let officials know that, for reasons of public health, they expect projects in their communities to be green.

Individual homeowners, as they approach remodeling projects, need to fully understand their green building options. As they seek architects and contractors with green building expertise, they will increase demand for green building products and services.

Next steps for Boston— A 10 Point Action Plan

LEED by example: The City of Boston should adopt LEED Silver as the design and construction standard for the renovation and new construction of all City facilities including USGBC Certification, thereby building on the success of its three existing high performance green buildings.

Require LEED Certifiable for City-supported projects: The City of Boston should require LEED Certifiable as the design and construction standard for all new construction and major renovation projects receiving City funding or land, including land disposition and RFPs. USGBC LEED Certification should be encouraged but not required.

Amend Article 80 to require LEED Certifiable: The City of Boston should amend Article 80 of the Boston Zoning Code to require LEED Certifiable as the design and construction standard for all projects undergoing large and small project review. USGBC LEED Certification should be encouraged but not required.

Craft a three year implementation work plan: To allow for public notice, staff development, and changes in professional and industry practice, the Task Force recommends that the City develop a work plan that brings these goals into full implementation within three years.

Provide training for City employees: The City of Boston should make Green Building LEED training available for City employees across nine different departments, including the BRA, DND, ISD, Schools, Mayor's Office, and Environment. This will allow these employees, and the City as a whole, to better assess and assist projects at every stage in the planning, design and review process.

Provide technical assistance: The City of Boston, in partnership with the Green Roundtable, should offer technical assistance to projects in order to help developers make good decisions at the earliest stages of planning their projects.

Provide predevelopment funding: The City of Boston should create a Green Building Pre-development Loan Fund to promote green project design and planning. Loans should be repaid at construction finance closing, and the program should sunset once common practice has shifted.

Residential assistance: The City of Boston should initiate efforts to bring the benefits of green building to both newly constructed and existing residential buildings by creating a "Green House Doctor" program to provide technical assistance to homeowners and residential contractors.

Residential recognition: The City of Boston should initiate efforts to increase public awareness about the benefits of high performance green building for residential buildings by establishing a signature City of Boston "Green Home" standard to recognize best practices and design innovation in residential construction and renovation.

Distributed generation: The City of Boston should support legislation requiring local utilities to meet new interconnection standards that allow projects to incorporate distributed generation such as photovoltaic cells and onsite combined heat and power generation units. The City should continue to work with the Distributed Generation Collaborative and with the Commonwealth's Department of Telecommunications and Energy to develop consensus on these standards and the role of distributed generation in the distribution of electric power.

The way we build...

Set goals

*What do I need, and what do I want?
What will it add to my life or to my
business?
Who am I building for? What do they
need and value?*

Green buildings:

- > provide pleasant places to live and work;
- > protect and preserve your health and your environmental resources;
- > offer significant returns on investment;
- > attract, retain, and optimize employees.

Design

*What can raise the stature of my
organization?
What would be welcome in my
community?
How can I get the most for my money?
Who can I turn to for expert guidance?*

Green buildings:

- > can exceed program and aesthetic goals;
- > are increasingly attractive to tenants, owners, and communities;
- > create opportunities for cost savings;
- > are attracting more designers, developers, trades, financial institutions, and governments, growing the pool of expertise and resources.

Define and plan resources

*How can I plan for maximum success?
Who should be involved?
What fits in my budget?
What assistance is available?*

Green building projects:

- > maximize collaboration and minimize miscommunication by involving all parties from the beginning of the project;
- > use materials and methods that are becoming increasingly common and price-competitive;
- > are supported in part by federal, state, and local agencies.

Permitting and building

*How does green building affect
construction logistics?
Are green buildings harder to build?
Are green buildings more expensive to
build?*

Green building projects:

- > mitigate many construction challenges and late surprises;
- > speed through local approvals due to thorough and early planning;
- > use materials safer to install;
- > can cost less than local averages per square foot.

Occupy and maintain

*How can I maintain my home or
workplace for maximum efficiency?
What difference would a green
building make to its occupants?
Are green buildings practical?*

Green buildings:

- > provide healthful environments that encourage high performance;
- > provide equal or superior occupant facilities;
- > save substantially on energy and maintenance costs.

Update

*How can I get more from my invest-
ment in my workplace or home?
What steps can I take to make my
home more energy efficient?
Where can I look for information on
making my building more green?*

Green renovation:

- > can convert an old, inefficient building to a high performance building.

...can positively affect our economy, health, performance, and environment.

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