



Greening Georgia Facilities: An Analysis of LEED[®] Requirement Impacts



Sustainable Facilities & Infrastructure Georgia Tech Research Institute

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EXECUTIVE SUMMARY

This report focuses on green building policies that affect state funded, owned, or leased buildings and provides recommendations for how best to proceed to encourage green building in State of Georgia facilities. This report is the result of research performed by the Sustainable Facilities and Infrastructure Branch (SFI) of the Georgia Tech Research Institute (GTRI), with support from the Georgia Environmental Facilities Authority (GEFA). The purpose of this study is to provide the state with data, analysis, and specific recommendations to support its decision as to whether or not such a policy is in the best interest of Georgia residents, and to recommend next steps that can be taken to advance the goal of green building for state facilities.

Interviews with key stakeholders from state agencies in nine of the eleven states that have adopted formal green building policies provided data that was essential to capturing lessons learned from those who have experienced LEED mandates within their organizations. The information collected during this interview process has been captured in the form of case studies summarizing the green building programs in the nine states that were assessed.

The report also provides an overview of Georgia's readiness and receptivity toward green building at the state level, including an examination of the current green building marketplace in Georgia, a description of current capital processes in place for State facilities, and notable policy trends and actions that have influenced those processes in recent years. The state of the art of green building in Georgia provides a summary of state-level policy initiatives, state agency initiatives, and other public and private green building initiatives and incentives that presently exist in Georgia. These data combine to form the basis for evaluating potential green building policies for the state.

The findings of this study suggest that Georgia is ready to begin the process of implementing its own green building program for state-owned buildings. In defining the elements that could be incorporated as part of an overall green building program for the State of Georgia, three basic categories of options emerged: Policy; Program; and Evaluation options. Policy Options examined in the study included: (1) meet LEED or equivalent; (2) endorse and encourage LEED or equivalent; (3) create programs to encourage green building activity; and (4) create a council or task an agency to develop standards or plans. Program options examined in the study included: (1) technical Support; (2) training; (3) guidance documents; (4) demonstration projects; (5) incentives/subsidies; and (6) modified institutional practices. Evaluation options examined in the study included: (1) third party certification, LEED or equivalent; (2) regular reporting requirement; (3) performance monitoring and reporting; and (4) post occupancy evaluation.

Each of these options was evaluated according to its social, environmental, and economic impacts as well as implementability within the current state context. From these options the study identified and evaluated four different potential paths that the state of Georgia could take in the pursuit of greening its state facilities: (1) Maintaining Momentum; (2)

Working with the Willing; (3) Coalitions and Consensus; and (4) Legislating LEED. Given the current state of green building in Georgia and the level of knowledge, acceptance, and adoption among state stakeholders, this study suggests that while Legislating LEED could be the desired end state of a policy process, several steps must be taken and assets put in place before such a policy could be successful in this state. Any combination of Working with the Willing and Coalitions and Consensus options would likely be effective in increasing the level of green building activity undertaken for state-owned buildings within the present organizational and political context and would lay a substantial foundation for future policy efforts.

Several immediate next steps are recommended as short term actions that can piggyback on current activities to address specific gaps explicitly identified by Georgia agencies:

Inventory/Gap Analysis of GA Resources and Agency Needs to Develop Investment and Funding Recommendations - There is a need to map and prioritize opportunities for green building programmatic support within current agency operating procedures. Concurrently, a regularly-updated inventory of local, regional, and national resources in green building is needed to determine what assets are presently available to Georgia agencies, their degree of utilization by state entities, and what programs are missing that would address agency needs. The benefits of this initiative would be the effective use of existing resources and the ability to make strategic decisions about what new programs will be most critical to advancing green building in the state.

Voluntary Sustainable Design Guidelines for the State Construction Manual Based on What Works in Georgia - As Georgia revises its State Construction Manual, it faces a unique opportunity to incorporate sustainability principles and best practices into a guiding document that will touch nearly every agency and every state building to be constructed for the next several years. The outcome of such an effort could be a stand-alone module within the State Construction Manual that guides stakeholders of future projects toward choosing the most effective sustainability tactics for their projects.

Building the Business Case for Green: Building Performance Data Collection as Part of Agency Annual Facility Reporting - A strong business case would be required to motivate legislative or executive action for more formal green building mandates or endorsement. Sustainability-related data collection could be piggybacked on existing efforts to provide an unprecedented level of consistent, regular data about real building performance over the life cycle correlated with initial green building design and construction tactics, resulting in a quantitative evaluation of what tactics really make most sense for state buildings.

Working Group to Identify Vision and Plan of Action - Key stakeholders involved in planning, designing, constructing, operating, maintaining, and decommissioning state facilities must agree on a vision for what is desirable, and must develop a coordinated and aligned plan of action to achieve that vision. The outcome of a working group, be it voluntary or formally appointed, would be a broadly supported vision for what green

building should look like for state-owned buildings in Georgia, plus a discrete and tangible action plan specifying intermediate steps necessary to achieve the vision.

Consensus-based planning is likely to result in more willing and widespread adoption of green building goals and tactics than directives issuing from a single source. As such, the working group approach stands the best chance of developing a plan which will be successful in achieving the true goal of this project: increased sustainability for state-owned buildings in Georgia.

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CHAPTER 1: INTRODUCTION AND STUDY DESIGN

As the benefits of green building such as cost savings and improved worker productivity become more apparent, many local, state and federal agencies in the United States are adopting policies to ensure that their facilities are designed to be green. Many of these policies are based on the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED¹) standard. There are varying levels of LEED adoption. Some agencies require that all buildings become certified by the U.S. Green Building Council at a particular level (typically the Certified or Silver level), while others set a minimum size below which certification is not required, and some governments do not require formal certification but ask that agencies follow the LEED design guidelines.

This report focuses primarily on green building policies that affect state funded, owned, or leased buildings and provides recommendations for how best to proceed to encourage green building in State of Georgia facilities. This report is the result of research performed by the Sustainable Facilities and Infrastructure Branch (SFI) of the Georgia Tech Research Institute (GTRI) with support from the Georgia Environmental Facilities Authority (GEFA). This chapter describes the objectives of the project, the research methodology used to execute the project and establish findings and conclusions, and the expected outcomes, benefits, and impacts of those findings and conclusions.

Project Aims and Objectives

Proponents of green building in the state of Georgia support the adoption of a policy that will increase the use of green building practices in state buildings, with all the attendant benefits entailed. The purpose of this study is to provide the state with data, analysis, and specific recommendations to support its decision as to whether or not such a policy is in the best interest of Georgia residents, and to recommend next steps that can be taken to advance the goal of green building for state facilities. Specific objectives of the project were to:

- Identify and evaluate the success of green building policy implementation by other state governments
- Baseline current capital project procedures in Georgia agencies with respect to understanding the organizational context in which a green building policy would operate
- Summarize the lessons learned from other states and their relevance to Georgia
- Make recommendations regarding future actions to promote the adoption of green building practices in Georgia state facilities

¹ LEED[®] is a registered trademark of the United States Green Building Council. For the sake of simplicity, the registered trademark designation is not used throughout this document, but is assumed to apply wherever the acronym LEED is used.

The next section describes the design of this study aimed at achieving these objectives.

Research Methodology

The approach for achieving the objectives described in the previous section consists of three primary tasks, illustrated in Figure 1.1: Research Approach.

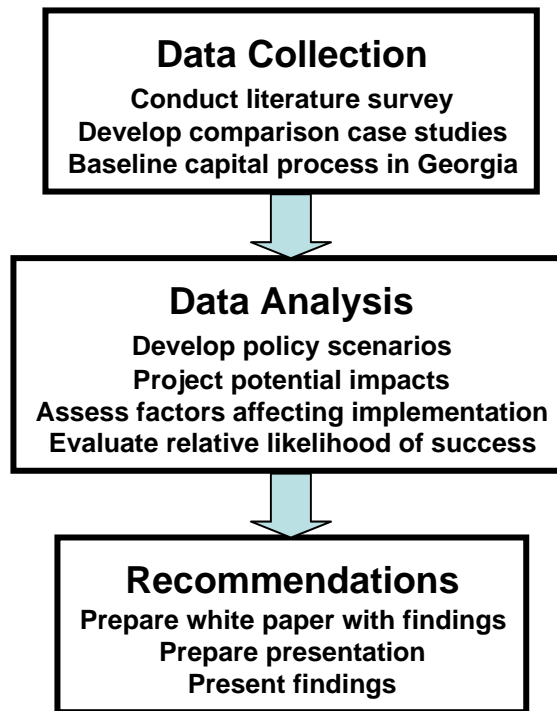


Figure 1.1: Research Approach

The following subsections describe each of these tasks and the methods used to perform them in greater detail.

Task 1: Data collection

The first task was to collect data necessary to understand the impacts of green building policy adoption in other organizations and to baseline current state agency practices, procedures, and governance that would be influenced by such a policy in Georgia. Three basic methods were performed to collect the relevant data:

- Conduct a literature survey of cost studies and other policy-related documents pertaining to green building to establish background and state of the art
- Develop case studies about identified states that have adopted green building policies by interviewing key stakeholders from those states to capture lessons learned and creating summaries of the different states' experiences

- Develop an understanding of Georgia's capital project process and its context in its current form by interviewing key stakeholders from Georgia agencies and reviewing prior policy attempts and green building resources in Georgia

The next sections describe these subtasks in further detail.

Subtask 1: Conduct Literature Survey

The first subtask focused on identifying documented life cycle costs and benefits of green building and LEED certification in other projects as reflected in the formal and informal literature. The purpose of this task was to inventory existing efforts to establish the business case for green building in the context of public facilities as a basis for predicting potential and likely impacts of such a program in Georgia.

The literature survey tapped both electronic and physical references in the green building literature. Search terms included 'cost benefit' combined with 'sustainable buildings' and these two terms with 'green building,' 'economics' with 'sustainable buildings' and with 'green buildings,' and 'evaluation LEED policy'. Initial references were also good sources of information for other references based on items contained in their bibliographies.

The primary outcome of this subtask was a conceptual framework to describe the elements of green building programs that are required for their success. Chapter 2 describes this framework in greater detail, along with findings from Subtask 2 as examples of program elements. A secondary outcome was an annotated bibliography of key resources that establish a business case for green building, contained in Appendix B to this report.

Subtask 2: Develop Comparison Case Studies

The second subtask was oriented toward identifying potentially comparable instances of LEED and other green building policies in states and documenting the costs, benefits, and lessons learned by agencies that implement the policies. A number of methods were employed to ensure that all relevant states with green building policies were identified. Most useful was the list of governments using LEED that was updated by the USGBC in August 2005 (Templeton 2005). To attempt to capture states that have adopted green building policies that are not based on LEED, the team also performed web searches with various combinations of the following terms: 'green building policies,' 'green building policy,' 'green building program,' 'LEED,' 'policies,' 'adopt LEED standards,' 'state,' 'facility,' 'evaluating' and 'performance.' Chapter 2 describes the outcomes and results of these searches.

From the complete list of states considering green building polices, the research team selected those which have a formal green building program or policy specifically targeted toward state-owned facilities, since this was the primary focus of this project.

Table 1.1: Other State Green Building Stakeholders Interviewed

State & Agency	Name	Title
Arizona		
Department of Commerce Energy Office	Jim Westberg	Energy Program Administrator
California		
CIWMB Sustainable Building Program	John Blue	Facilitator of Green Building Task Force
CIWMB Sustainable Building Program	Kristen McDonald	Analyst
CIWMB Sustainable Building Program	Gregory Dick	Integrated Waste Management Specialist
CIWMB Sustainable Building Program	Clark Williams	Integrated Waste Management Specialist
Colorado		
Governor's Office of Energy Management & Conservation	Linda Smith	Engineer
Maine		
Interface, Inc.	Wendy Porter	Director of Environmental Management
Maryland		
Department of Natural Resources	Sean McGuire	Green Building Program Coordinator
Nevada		
USGBC Las Vegas	Lance Kirk	President
USGBC Las Vegas	Richard Warren	Treasurer
New York State		
Energy Research and Development Authority	Craig Kneeland	Senior Project Manager
Pennsylvania		
Governor's Green Government Council	Paul Zeigler	Director of Engineering & Building Technology
Washington State		
Department of General Administration	Stuart Simpson	Green Building Advisor

Stakeholders from each of these states were phoned with a request for an interview, and interviews were scheduled either with the initial point of contact or additional stakeholders that the point of contact believed would have more relevant information. Of the eleven states identified as candidates for interviews, the research team was able to reach and successfully interview stakeholders from nine states. Table 1.1 lists the state interviewees contacted as part of this study.

Interviews with key stakeholders from these public agencies provided data that was essential to capturing lessons learned from those who have experienced LEED mandates within their organizations. These interviews were conducted by two or three project team members over the telephone and lasted between 45 to 90 minutes. A transcription was made of each interview to facilitate later review and analysis. The interviews focused not only on successes but also challenges, failures, and pitfalls that may have been experienced in each state and could potentially be avoided in Georgia. Interviews also sought to elicit the history and evolution of green building programs in each state being investigated as a basis for determining potential similarities to Georgia’s current political and environmental context. Table 1.2 shows the specific interview questions used for this process.

Table 1.2: Other State Green Building Program Interview Questions

Please describe your state’s green building program. Is it voluntary or mandatory? When did it go into effect? Is it LEED based? Are any agencies or building types automatically exempt? Are there any centralized program management or reporting/enforcement requirements?
What activities within the state led up to the development of policy/guidelines?
Who were the primary advocates/key players in program development?
What have been some of the primary barriers that have slowed green building within your state agencies?
What other programs in the state support green building (including agency-specific and residential programs)?
Why is your program successful (key people/agencies/policies that make it work)? What are its strengths?
If you had it to do all over again, what would you change? What are the program’s weaknesses?
Have there been or are there plans for a program evaluation or cost/benefit analysis?

The outcome of this task was a set of case studies summarizing the green building programs in the nine states interviewed. These case studies, along with the transcripts of interviews with each stakeholder, served as input for the analysis phase of the project.

Subtask 3: Baseline Current Practice in Georgia

The third subtask in Phase I of the project focused on defining the current state of the art in capital project processes for state buildings in Georgia. Also material to this subtask was an overview of the market conditions for green building in the state, and a detailed examination of green building practices and attitudes for six of the largest facility-owning agencies in the state and two of the agencies that support green building by other entities. In order to more accurately predict the impacts of adopting a green building policy in Georgia, it was imperative that researchers understand the process for facility development in the state.

Specific actions performed for this subtask included:

- Identifying key stakeholders to provide relevant information
- Developing an interview protocol and scheduling interviews
- Conducting interviews with ten stakeholders from eight different agencies to ascertain goals, constraints, and considerations regarding a green building policy for state buildings in Georgia, and documenting findings of those interviews as mini-case studies within Chapter 3 of this report
- Reviewing and summarizing the state of the green building market in Georgia as a context for the state policy
- Reviewing relevant documents, including elements contributing to the new Georgia State Construction Manual and other guidance and policy documents used by state agencies
- Reviewing prior efforts to establish a green building policy in the state, and identifying lessons learned from these attempts
- Documenting the current process for delivery of state facilities, along with key factors that must be considered for successful integration of green building with that process

Table 1.3 lists the key stakeholders identified and interviewed from Georgia agencies and other local governments.

Table 1.3: Key Georgia Stakeholders Interviewed

Agency	Name	Title
Department of Transportation	Gordon Jett	State Facilities Manager
Georgia Building Authority	David Clark	Director, Facilities Division
Georgia Building Authority	Debra Elovich	Senior Project Director
Georgia State Financing and Investment Commission	Gena Abraham	Director of Construction Division
Board of Regents of the University System of Georgia	Sandra Neuse	Environmental Health and Safety Program Manager
Georgia Department of Natural Resources	David Freedman	Chief Engineer
Department of Technical and Adult Education	Tony Bruehl	Director of Facilities Management
Georgia Office of Planning and Budget	Ron Nawrocki	Manager of Capital Budgeting
Formerly with City of Atlanta	Cyrus Bhedwar	Former, Liaison and Research Fellow
City of Atlanta	Bridget Flood	Liaison and Research Fellow

The interviews were conducted in person by two or three members of the project team. Interviews lasted between 45 and 90 minutes and were transcribed. These interviews were conducted following a semi-structured process, modified as relevant to each agency and its programs. The interviews covered the following basic topics:

- 1) What has been your agency’s experience, if any, with green building?
 - a. Cases/exemplars of green building projects
 - b. Formal or informal educational programs, if any
 - c. Champion(s) – name and title/role
 - d. Incentive structure, if any
 - e. Resources, if any – source and type
 - f. External yardsticks, e.g., LEED or other metrics
 - g. Overall story of green building within the agency – how did the program get started?

- 2) How does your agency’s capital project program fit within the larger state framework for capital construction? How would changes at the state level affect your projects?
 - a. Funding sources
 - b. Use of GSFIC resources vs. internal project management
 - c. Experiences with OPB and capital outlay
 - d. Use of information resources like the State Construction Manual

- 3) What kind of policy would be most effective in encouraging your agency to increase the number of green projects you undertake?
 - a. Structure, e.g., executive order vs. legislation vs. other
 - b. Incentives/penalties
 - c. Resources/information provided by state
 - d. Evaluation metrics
 - e. Point of entry into the process
- 4) What kinds of barriers have you experienced in building green? What barrier breakers have worked/not worked? If you do not yet have green building experience in your agency, what would you expect to get in the way, and how would you address it?
 - a. First cost barrier
 - b. Lack of knowledge internally or externally
 - c. Lack of resources, e.g., time, information, etc.
 - d. General resistance to change/territorialism
 - e. Existing policies/practices/priorities
 - f. Other
- 5) From whom might you expect opposition to a green building program? Why? How might such opposition be overcome?
 - a. Lobbyists
 - b. Internal personnel (role/authority level)
 - c. External, e.g., A/Es, Contractors, etc.
 - d. General public
 - e. Other
- 6) What resources/actions/information do/would you need to make a green building program work?
 - a. Funding
 - b. Educational programs
 - c. External technical assistance
 - d. Information/implementation resources, e.g., design guides, checklists, etc.
 - e. Other

The outcomes of this task were a description of the current facility delivery process in Georgia and a characterization of key attributes that will determine what kind of green building policy is likely to have the highest probability of success in this context. These attributes, along with lessons learned from Georgia agency experiences with green building, served as input for the data analysis process, described next.

Task 2: Data Analysis

After data collection was complete, the next step in the project was to analyze the data and identify lessons learned and other information that could be used to inform recommendations for a green building program in Georgia. The purpose of this task was to synthesize data collected in Task 1 from the three different types of sources: the literature on green building policies, case studies of states with green building policies, and documentation of the capital facilities process in Georgia.

Results of the synthesis of the case studies of other states' green building policies are described in Chapter 2 of this report. They include a framework for green building programs that describes four primary elements of a program: Inspiration, Motivation, Implementation, and Evaluation. Chapter 2 contains examples of each element in the framework from different states' experiences, along with a synthesis of lessons learned and inhibitors and enablers for green building based on the experiences of other states.

The synthesis of data pertaining to current conditions in the state of Georgia is described in Chapter 3 of this report. The outcomes of this synthesis include an overview of considerations that must be addressed for a successful policy in the Georgia context, along with lessons learned from prior green building policy attempts in the state.

Combined with the findings from the literature survey, the synthesis of other states' information combined with state of practice in Georgia set the stage for developing policy scenarios and recommendations, discussed in the next section on Recommendations.

Task 3: Recommendations

The third task focused on the development of specific recommendations for the state of Georgia regarding the development of a green building program for state-owned buildings and possible adoption of such a green building policy. Toward this end, lessons learned from other states as well as from Georgia agencies with experience in green building were combined with theory from diffusion of innovation and program sustainability to develop a set of evaluation criteria for potential program elements in four broad categories: social impacts, environmental impacts, economic impacts, and program implementability.

In parallel to development of evaluation criteria, options were defined for three different elements of green building programs: policy options, program options, and evaluation options. These options were based on best practices identified in other states as well as knowledge of practices used by other non-state green building programs around the world. Options in each category were comparatively evaluated in terms of their likely social, environmental, and economic impacts and overall implementability in Georgia. These options then were configured into four potential scenarios for implementing green building in Georgia, representing a spectrum of different levels of effort and likelihood of success as follows:

- Maintaining Momentum
- Working with the Willing
- Coalition and Consensus
- Legislating LEED

Chapter 4 describes each of these scenarios in more detail, along with the pros and cons of each. Based on the current context of Georgia, Chapter 4 contains recommendations

for how these options could be progressively implemented over time to effectively and sustainably further the goal of green building in Georgia for state-owned buildings. The chapter concludes with descriptions of specific action items identified by state of Georgia stakeholders throughout the project that can be undertaken to address immediate gaps and provide the tools necessary to make both short- and long-term progress toward green building goals.

Project Outcomes, Benefits, and Impacts

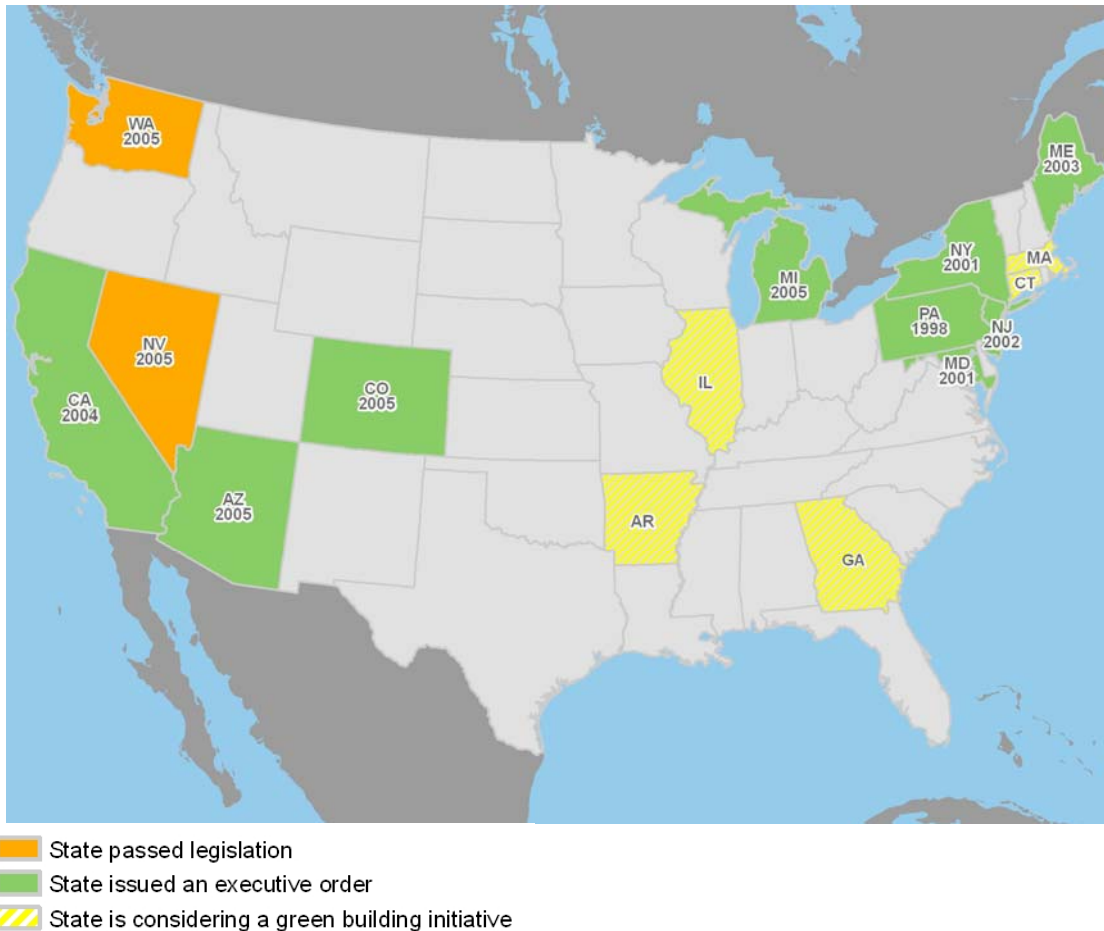
The ultimate desired impact of this project is the eventual successful adoption of a green building policy by the State of Georgia that maximizes benefits to the State at an acceptable cost. As a result of this study, state agencies will be equipped to provide the State of Georgia with detailed recommendations based on collected data to support decision makers in determining what kind of policy will best provide sustainable facilities (and their associated benefits) at a reasonable cost. In addition to supporting the State of Georgia, this study also makes a valuable contribution to the green building field in which an analysis of state-based green building policies in practice have not been thoroughly evaluated.

The next chapter in this report contains the findings regarding statewide green building policies around the nation from the literature review and interviews with employees from agencies involved in the implementation of those policies. Following that is a chapter on the capital facility planning process in Georgia. The final section of the report is the culmination of the research effort into a set of scenarios and recommendations for moving forward. The report also contains appendices with case studies for each of the nine states outside Georgia that were interviewed, and an annotated bibliography of resources useful for establishing a business case for green building in Georgia.

CHAPTER 2: STATE OF THE ART IN STATE GREEN BUILDING PROGRAMS

Important precedents exist for green building programs at the state level that can provide lessons learned for Georgia as it considers a policy of its own. According to the USGBC, sixteen other states currently have a LEED policy either in the process of being enacted, under consideration, or already in place (Templeton 2005). Figure 2.1 identifies all states with green building programs affecting state facilities (residential or private sector programs are not included). Eleven of those states have successfully issued policies that promote green building practices specifically for state-owned buildings.

Figure 2.1: States with Green Building Programs



This chapter provides an overview of methods, approaches, and lessons learned for nine of those eleven states based on review of the literature, interviews, detailed policy analysis, and case study development. Appendix A to this report contains detailed case studies describing the experiences of each of those nine states and providing documentation to support the summary of findings developed in this chapter. The chapter is organized within a framework of four elements that define green building programs in general (Inspiration, Motivation, Implementation, and Evaluation), and it concludes with a summary of state-level lessons learned in terms of inhibitors and enablers that affect the success of green building programs in implementation. These points of comparison provide a useful starting point for Georgia as well as a concept for what is possible in green building programs.

What are the components of state green building programs?

As the research progressed, a framework began to emerge as a general model to describe how green building programs evolve in public agencies. The framework consists of four basic elements, shown in Figure 2.2, which incorporates key phases of the generic diffusion of innovation process described in Rogers (2004) and are essential components to the success of any green building program, although they may be implemented in different ways by different stakeholders in different contexts. The framework mirrors an innovation adoption process, beginning with an Inspiration phase that includes knowledge, awareness and persuasion that move a person or entity to adopt a green building policy or practice. Inspiration may be, at some point, followed by Motivation, the stage in which a formal or informal policy is developed to shape subsequent agency actions toward meeting green building goals. Motivation is followed by Implementation, where programs are developed to support the activities needed to meet the goals of the policy, followed by Evaluation, where compliance with policy requirements and assessment of program performance is undertaken.

Figure 2.2: Framework for Successful Green Building Programs



These four framework elements provide a structure for mapping the different ways in which organizations have approached each step in creating a green building program. The following subsections describe each element of the framework in greater detail, and include specific examples of different ways in which states have experienced each of these elements.

Element 1: Inspiration

Inspiration, in the context of this study, can be defined as an activity that increases awareness about green building. It includes formal and informal mechanisms by which stakeholders become informed about the benefits and opportunities of more sustainable design and begin to consider its application in their own situations. Exposure of stakeholders to green building concepts can come through a variety of channels, including:

- Reading about green building in trade publications or journals
- Attending meetings with speakers who address the subject
- Interaction with colleagues who have green building interest or experience
- Participation in formal training or conferences on green building
- Discussions with sales/marketing people from green building product manufacturers

Such exposure can be intentional or unintentional on the part of any given stakeholder, but even uninterested stakeholders have an increasing likelihood of hearing about green building concepts just by virtue of doing their jobs on a daily basis. Coverage of green building and sustainable development concepts has increased almost exponentially in the United States in the past ten years, as evidenced by the growing number of articles in general trade publications and sustainability-related tracks in traditional industry conferences, the emergence of publications, courses, and conferences dedicated specifically to green building issues, and even coverage in popular press and television.

Some stakeholders may come to be inspired to pursue green building by virtue of being faced with an external threat or crisis that requires a change in the status quo, such as energy or water shortages, volatility in fuel or building material prices, specific environmental constraints associated with project sites, or natural disasters that offer significant opportunities to rebuild. With their focus on resource efficiency and reduced environmental impact, green buildings offer a chance to invest in solutions that reduce demands on resource bases and ecosystems both initially and over their substantial life cycle. This benefit means that sustainable solutions can emerge as leading contenders in crisis situations.

Three specific categories of inspiration activities were identified during the interview process with states that involve activity by state agencies, including prevailing conditions (i.e., circumstances), leadership, and state activities to encourage green building in the

private sector. Additionally, the following subsections include a description of how some states have met opposition to green building policies in order to pass executive orders (EOs) or legislation, and sometimes even inspired opponents to become advocates of sustainable design.

Prevailing Conditions

As with the adoption of most policies or programs, a variety of circumstances create a climate in which new ideas are accepted and allowed to flourish, even in the midst of opposition. The presence of a crisis cannot be underestimated as an impetus for garnering support for green building policies and programs. For example, the Chesapeake Bay had been suffering from many years of pollution, causing several administrations to work toward improving the quality of the Bay in the state of Maryland. In Arizona, Phoenix experienced brownouts in the summer of 2004 due to the failure of a large transformer. In Maine, extremely high energy costs made green building more attractive. In addition to crises, other conditions, such as the recognition that high operation and maintenance costs of state facilities could be reduced through green design, help to create a climate that is conducive to green building policy and program development. Fast growing states such as Arizona sometimes recognize the importance of implementing green building policies and programs to ensure that the buildings they will add to their inventory are well designed, provide a better working environment, and are more efficient to operate.

Leadership

Whether initiated by the Governor, an agency head, lower ranking personnel or even those working outside of state agencies, green building activities will only occur within a state if there are champions to promote them. Whether motivated by personal conviction, political gain, economic benefits or some other impetus, someone (or a group of persons) becomes inspired to launch new programs or policies. Advancing a more sustainable approach to building design, construction and operation/maintenance from an occasional occurrence to standard operating procedures within all state agencies requires dedication, determination and tenacity on the part of green building champions. They will encounter a number of people who are opposed to changing the building process due to fear, a lack of understanding about green building strategies, or an unwillingness to part with the old way of doing things. Typically, it takes a larger number of champions working from the bottom up within organizations and fewer champions (such as the Governor) at higher levels with greater decision- and policy-making authority to make significant changes in a relatively short period of time.

Within the states evaluated, several passed executive orders (EOs) and legislation primarily because of the work of strong supporters in high positions (e.g., such as the Governor or State legislators in both houses). For example, in Nevada, the local chapter of the USGBC (and a very active one at that), was surprised to learn that legislation had been proposed by an assemblywoman that would require LEED certification for all state buildings. Quickly, the USGBC chapter organized its volunteers to help move this forward; legislation was passed in mid-2005. In Maryland, then Governor Parris Glendening advocated smart growth initiatives and high performance/green building policies, recognizing that it is not only important *where* we build, but also *how* we build.

He signed an EO in 2001 which ultimately resulted in a requirement that state buildings be LEED certified.

There are also examples of bottom-up approaches to passing green building policies. For example, there was very little green building activity in Maine when a resident and employee of a sustainability-minded manufacturing company attended the USGBC Greenbuild conference in Austin, Texas in 2002. She returned to Maine inspired to help create an atmosphere where green building would thrive. Soon thereafter she helped form a local chapter of the USGBC, and in 2003 the Governor signed an EO requiring the use of LEED standards. Sometimes friendly competition may inspire State policy; in at least one instance, the fact that a neighboring Governor had issued a green building EO is believed to be a factor in the passing of a state's own green building EO.

State Activities to Encourage Private Sector Green Building

Other green building activities in the private sector may influence the acceptability of a state-wide policy and advance the rate of adoption of green design and construction practices among state agencies. Additionally, positive publicity and recognition earned by private sector facilities may inspire state agencies to move forward that would otherwise be afraid of perceived risks of trying a new approach to facility construction. The existence of prominent private sector green buildings is also likely to increase awareness of the importance of green building among the general population. As the private sector builds more sustainable facilities, members of the design and construction community gain valuable knowledge and experience in creating green buildings and therefore build capacity among professionals.

A state may have a vested interest in providing incentives for private developers to design green buildings. The offering of monetary rewards is often incentive enough to inspire those thinking about green buildings to actually commence design and construction. In some states, tax incentives and/or utility rebates (sometimes required by state policy) are used to encourage green facility development. For instance, in 2000, the Governor of New York created the first statewide green building tax credit program in the U.S. Maryland now offers a green building tax credit for up to 8% of the total project cost for new and rehabilitation projects that meet specific criteria, including LEED Silver certification. In Washington, one utility company gives up to \$1.20 per square foot for beating the energy code by 25% and an additional 10% bonus if the project earns LEED certification. Nevada's new law develops a tax incentive to encourage the private sector to design and construct LEED Silver certified (or equivalent) facilities. The Commission on Economic Development (CED) in Nevada will grant partial property tax abatement for up to 10 years and 50% of the taxes on real property. The CED is responsible for developing the qualifications and methods for eligibility. Additionally, there is a sales tax exemption mandated in Nevada for products related to green building, including: products adapted to use renewable energy to generate electricity; solar thermal energy systems; solar lighting systems; and materials used in the construction of a building that meets requirements to be certified at LEED Silver level or higher. Going even further, Nevada Power/Sierra Pacific Power offers renewable energy incentives at \$3 per watt for solar and wind energy issued by the power companies (as mandated by the state).

Facing Opponents

Some agencies or people are more resistant to inspiration and may actually oppose green facilities. Opponents of state-wide policies often need more convincing, and the opposition comes in many forms. States typically find opposition from those in the construction field and other agencies (e.g., school districts, Departments of General Services) who believe that LEED and associated green building practices will increase design and construction costs more than is reasonable. Other opponents in states proposing mandatory LEED-based policies represent industry trade associations (e.g., forestry, vinyl, refrigerant manufacturers) that do not agree with a particular credit or point that can be earned in LEED, such as a point that is awarded when 50% of the lumber has been certified by the Forest Stewardship Council. Building owners sometimes oppose specific pre-requisites in LEED, such as commissioning, because they feel as though they pay dearly for proper design and installation and that commissioning should not be necessary. In order to pass state-wide policies, particularly legislation, it is important to address the questions and concerns of opponents. It is not necessary, and in fact is nearly impossible, to appease everyone, however. Some states have rather effectively addressed some opponents by allowing exemptions and providing allowances that address their concerns.

Inspiration may come from a variety of sources encouraging green building practices. At the state level, conditions that inspire agencies to adopt more sustainable design include prevailing conditions, strong leadership, encouraging private sector development and facing opponents head-on, but when a state decides that sustainable design and construction is important enough to develop a policy, this phase is called “Motivation.” The next section describes this phase of the green building program development process.

Element 2: Motivation

The second element, Motivation, refers to formal and informal drivers that actually compel people to incorporate green building techniques on their projects. These can range from internal motivation where people become convinced through repeated exposure to green building information during the Inspiration stage that they would like to try green building tactics on their own projects, to formal, external motivators such as executive orders, legislation, or internal policies that encourage or require green building action. At the Motivation stage, some stakeholders may have already had exposure to green building through the Inspiration process, but others may be suddenly subject to the concept without prior exposure, particularly in the case of mandates such as executive orders or legislation.

Green building policies typically fall within the Motivation stage, although they may specify or create components that fall within Implementation and Evaluation stages as well. Formal, written policies fall along a spectrum of permanence corresponding to the mechanism used to institute them. For instance, at the state level, policies can be issued as executive orders by the governor, or as legislation formally passed by the legislature. The former is less permanent since it can be rescinded or superseded by subsequent governors when the issuing governor leaves office, or it can lose urgency even if it remains in effect when a new governor with different priorities takes office. Executive

orders typically have no formal enforcement mechanism, although they may include metrics or formal evaluation and reporting procedures to encourage compliance.

Legislation, on the other hand, is considerably more permanent since it is passed by the state legislature and is therefore unaffected by changes in administration. It is also typically much more difficult to put in place, since it must receive majority support across multiple elected officials through the formal legislative process and is subjected to more scrutiny and possible opposition from lobbying groups. Legislation also has “teeth” to encourage compliance, since failure to comply is actually breaking the law. While the nature of penalties depends on the specific legislation, a legislation-based green building policy has a much higher likelihood of being successful in the implementation phase due to the broader level of sustained support it must achieve in order to be issued in the first place.

It is often difficult to pass a green building policy of any sort, even in states such as Washington and California that are recognized leaders in enacting laws to protect the natural environment, although prior EOs or legislation can help to set the stage. In Pennsylvania, prior to the signing of an EO that established the Governor’s Green Government Council, several other related EOs were already in place including one that requires life cycle costing of state buildings and major equipment purchases. Similarly in Maryland, several EOs were already in place to provide protection for the Chesapeake Bay.

Sometimes repeated attempts are required to pass an EO or legislation. For example, in Colorado, a group of environmental professionals attempted to get legislation passed requiring State agencies to implement policies to promote sustainability and recommending the use of LEED, one year prior to the eventual signing of the EO by the Governor. Senators in Nevada had tried to pass energy related bills without success prior to passing the 2005 legislation requiring green building and other energy-related measures. In California, Governor Schwarzenegger vetoed a bill based on former Governor Davis’ EO and signed an EO that more strongly supports his green building goals. Clearly, there was already the presence of green building supporters within state government based on the existence of a previous EO.

Not only are state-wide policies important, but policies can also be established at the agency level or even lower in the hierarchy within state government. Whether such policies are formal memoranda from agency heads or unwritten consensus at the grass roots level, they still have the effect of causing a change in behavior from the status quo toward achieving sustainability goals. The Motivation milestone represents a coordinated decision, and in some cases a public declaration, to act consistently to move toward sustainability goals. The issuance of a formal policy for green building can be organized around a variety of goals ranging from energy efficiency to waste reduction to human health and productivity, or any combination of salient issues that resonate with the context of the policy and its implementing agency. The policy can specify formal evaluation mechanisms as well as specific programs to be implemented, or it can leave these details to the agency or stakeholders implementing the policy.

The states that were included in this study all have adopted formal green building policies. While there are many states and state level agencies that have made informal decisions to build a green building or incorporate green building principles in their general construction practices, these organizations were not included in the scope of this research project. Because formal policies leave a paper trail, they are more obvious and therefore easier to identify and study. The formal statewide policies that were identified consisted exclusively of executive orders and legislation. Since executive orders require less political capital to enact, they outnumber the pieces of legislation mandating green building practices in state facilities; in fact only two states have passed laws regarding green building. There is also considerable variability in the content of the actual directives themselves.

Analysis of actual policies provides a rich basis for comparing the various frameworks and mechanisms put in place to mandate or encourage green building. The following subsections include a discussion of the kinds of elements which are seen in actual green building policies that were adopted by the states studied for this report, including reference standards, energy-specific elements, decision making bodies, exemptions and special provisions, unique elements, linguistic ambiguity, and programs to support implementation.

Reference Standards

With the exception of Pennsylvania, all of the states reviewed in this study refer to the USGBC's LEED standard in their policy directives. These policies generally require that both new buildings and renovations be built using the LEED standard as a guideline. Three states, Maryland, Washington and California specify that buildings must meet the Silver level of certification. California and Colorado also apply LEED to their existing building stock. While some of the states have clearly said that facilities must be certified, other states require that buildings be designed following the LEED guidelines or that they meet LEED or equivalent standards, without clarifying how compliance will be determined and verified. While LEED is the most widely recognized and utilized green building standard, there is some deference to the possibility of competing standards as evidenced by Nevada's law which says that state funded buildings "will meet the requirements to be certified at *or meet the equivalent of* the base level or higher in accordance with the Leadership in Energy and Environment Design Green Building Rating System, *or an equivalent standard.*"

Energy-Specific Elements

Some states have added additional components to their orders such as requiring meeting energy reduction goals or renewable energy portfolio targets. In New York, buildings must meet both LEED and the green building guidelines from the tax credit law, beat the state energy code by 20%, *and* incorporate Energy Star standards. New York State directs agencies to develop and implement energy reduction strategies in existing buildings and requires that agencies reduce their energy consumption by 35% over 1990 levels by the year 2010. California's green building EO includes that requirement that state agencies purchase Energy Star equipment when cost effective.

There are also goals set for increasing the amount of energy that is derived from renewable sources. Arizona requires all new state funded buildings to get 10% of their power from renewable sources. New York aims to have 20% of its energy needs supplied by renewable sources by 2010. And Maryland's EO established a goal that 6% of energy used in state facilities should be derived from green sources (wind, solar photovoltaic, solar thermal, biomass, landfill gas and the combustion of municipal solid waste), with no more than 50% of the green energy total derived from solid waste combustion.

Decision Making Bodies

A common element in many of the policies studied is the formation of a council or task force to set green building guidelines or oversee the implementation of green building policies. Through its executive order, the Colorado governor created a Greening Government Coordinating Council and tasked the council with far reaching goals aimed at reducing overall environmental impact of the state government's activities. As part of its green building program, the state of Maryland established a Maryland Green Building Council led by the Secretary of the General Services Administration that included representatives from other agencies as well as six persons appointed by the Governor to represent environmental, business, and citizen interests. This council made recommendations to the governor regarding the use of green building standards and rating criteria to be used by state agencies. Similarly Nevada's legislation has tasked the Director of the Office of Energy to follow a prescribed process for evaluating and selecting a set of green building guidelines with the input from stakeholders. The Nevada legislation points to LEED but outlines the requisite elements a set of guidelines would have to follow if the director were to select something other than, but equivalent to, LEED.

Green building programs in Pennsylvania were not mandated by an executive order but rather were the result of the efforts made by the Governor's Green Government Council (GGGC) which was created by executive order. The GGC is responsible for assisting state agencies with prioritization of sustainability initiatives and for helping them with development of Green Plans. The Green Plans include agency-specific information about initiatives in areas such as land use planning, green purchasing, green buildings, green power, transportation, and recycling.

Exemptions/Special Rules

In most states, there are some agencies that do not fall under the governor's purview. In these cases, executive orders have often contained paragraphs asking for the voluntary participation of such agencies. For instance, local governments and school districts are not covered by the EO in New York, but they are asked to participate and the New York State Energy Research and Development Authority (NYSERDA) is directed to provide support to them when possible.

Washington State's bill contains several good additional examples:

- Schools are given the option to follow a special protocol of design guidelines created especially for them
- The department responsible for affordable housing has until 2008 to select and implement an appropriate green building standard for their projects
- Hospitals, research laboratories, transmitter buildings and pumping stations are exempt; and
- Any project may be exempted if the owner agency and the design team determine that LEED Silver is not practicable.

Almost of the states provide exemptions for small projects in the guidance documents that are produced as a result of the policies, but not in the policies themselves. Special concessions have also often been made to address industry pressure. Again, a good example of this is the language in Washington's Bill: "For the purposes of determining compliance ... the department of general administration shall credit the project for using wood products with a credible third party sustainable forest certification or from forests regulated under ...the Washington Forest Practices Act."

Another limitation that was seen in at least one of the policies was a limit to the liability for failure to achieve certification. The clause in the State of Washington's law is typical: "A member of the design or construction team as may not be held liable for the failure of a major facility project to meet the LEED silver standard or other LEED standard established for the project as long as a good faith attempt was made to achieve the LEED standard set for the project."

Unique Elements

While some policies are focused solely on establishing green building standards for state buildings, many of the policies include a wide array of issues beyond what has been described above such as state fleets, operating procedures, investment criteria, and others. For instance:

- Some policies reach beyond state facilities, e.g., in California the EO asks that the Teacher Retirement System seek investments in green buildings and green technologies.
- In order to equip future building professionals to design and construct green buildings, Nevada's legislation requires that the University System provide students with the essentials of green building design and construction to help them prepare to become LEED accredited professionals.
- New York's EO includes some very specific operating requirements to save energy such as turning off lights in unoccupied areas, shutting off unused equipment, and adjusting thermostats. New York's policy also includes goals for improving the fuel economy of state owned fleets.

Linguistic Ambiguity

It is generally the intent of the policy creators that all buildings covered by the policy actually go through the certification process, but often the language in the policies is ambiguous enough to allow for leeway in how it is interpreted by the responsible parties. Executive orders and bills have included a lot of loose language that provides for flexibility in interpretation and implementation. Some specific language pulled from these nine states includes the following qualifiers that provide “escape hatches” from the formal certification requirement:

- ...to the extent that it is deemed cost-effective
- ...to the extent applicable and practicable
- ...as resources become available
- ...whenever cost-effective
- ...to the maximum extent practicable
- ...provided this can be accomplished on a cost-effective basis, considering construction and operating costs over the life cycle of the building being constructed or expanded.

Careful attention to detail is important when developing a state-wide green building policy. The language and provisions it may include are critical to ensuring that implementation of the policy is successful. A well written policy with a clear and manageable scope is almost certainly more effective than a poorly written one with ambiguity.

Programs for Implementation

Green building policies have also included the establishment of programs to support agencies in implementing the green building mandate. For example, California Executive Order S-20-04 includes language directing the Division of the State Architect to “adopt guidelines that enable and encourage schools built with state funds to be resource and energy efficient.” Governor Pataki included a provision in New York’s EO directing State Energy Research and Development Authority to develop a set of guidelines to help affected agencies implement energy consumption reduction plans. They are also required to oversee the implementation of the EO and assist state agencies. Specific programs to support green building implementation are broad and varied, and the next section of this chapter, Implementation, discusses examples of such programs in greater detail.

Element 3: Implementation

The third element of the green building program framework is Implementation. This is the phase in which those parties responsible for implementing a formal or informal policy decide what programs and actions will be needed to meet policy goals and execute those programs and actions to achieve the goals.

Examples of Implementation programs and actions include:

- Technical assistance programs, both internal and privatized
- Education and outreach programs, both internal and privatized
- Incentive programs, including subsidies and grants to offset project costs
- Award programs
- Agency- or state-specific guidelines or application guides
- Modifying state operating practices such as establishing state contract vehicles for third party services like energy savings performance contracting.

The types of programs that are most effective in a given context depends on the level of market expertise on green building already existing in the state, the structure and culture of the state government in which the programs are being implemented, and the financial resources and/or third party funding such as grants that can be applied toward the program. Programs that are specifically mentioned and established in the formal policy during the Motivation stage typically have more success in motivating change, since they are formally endorsed by policymakers and can have resources explicitly provided for them if they are legislative in nature. Some specific types of activities to assist agencies in implementing a green building policy identified in this study include technical support, training, the development of guidance documents, and demonstration projects. The following subsections describe these programs in greater detail.

Technical Support

In order to increase green building capacity and to help ensure that sustainability principles are followed, some states provide technical assistance, either directly using their own experienced staff or indirectly by providing funding for technical assistance by other entities. For example, the NYSERDA administers an innovative and successful technical assistance program called FlexTech. Through this program, NYSERDA approves a list of qualified providers in various fields of expertise and makes these contractors available to a multitude of clients to perform customized technical assistance on a cost-share basis. In Colorado, the Office of Energy Management and Conservation provides free technical assistance to support energy performance contracting to all public agencies in the state of Colorado through its Rebuild Colorado program. In Pennsylvania, the Governor's Green Government Council has an experienced engineer on staff that provides direct assistance, primarily to state agencies but also to private sector clients, depending on his or her availability.

Training

Unlike technical support that provides assistance for specific projects, training opportunities are used to inform facility stakeholders on topics ranging from general sustainability awareness to technical details, such as daylighting strategies. In Maine, for example, the state provided several training courses on green building techniques, including official LEED training conducted by USGBC trainers, as well as other courses taught by volunteers with the knowledge and experience to train the building community.

In California, the Division of the State Architect, Department of General Services (DGS) has developed and participated in the development of sustainability-related training materials, including a series of videos, to advance green building in California. Pennsylvania has also produced a series of videos that are widely available via their web site. By making these resources publicly available on its website, state agencies can help a countless number of others both within and outside the state with their sustainable facility efforts.

Guidance Documents

State agencies sometimes develop guidance documents to assist agencies in implementing green building. In Washington, for example, school districts adopted the Washington Sustainable School Design Protocol and will be allowed to continue to use it rather than LEED for the next few years. The New York State Energy Research and Development Authority worked with a coalition of other agencies to fund the development of University at Buffalo's *High Performance Building Guidelines*. In Colorado, the State Energy Office is in the process of producing a guidebook for how to implement LEED in Colorado based on strategies that have worked given the unique climate, utility costs, typical payback, construction styles, and other factors unique to that state. The University of Colorado at Boulder is building LEED principles into their university design guidelines to ensure that all new buildings meet LEED Silver guidelines at minimum, though they will not be seeking formal certification. The California Department of General Services, Division of the State Architect was very much involved with the development of the Collaborative for High Performance Schools (CHPS) guide for creating green, high performance schools. The Commonwealth of Pennsylvania has produced several well-known guidance documents not only on sustainable design, but also on requirements for leased facilities to meet green objectives.

Demonstration Projects

There is perhaps nothing like the success of others to inspire one to try something innovative, including green design and construction. In Maryland, a long-abandoned Montgomery Ward mail-order warehouse building was converted into offices for the Maryland Department of Environment and other state agencies. This project, which includes a 30,000 ft² green roof, is considered to be quite successful and has been used as demonstration facility to encourage others to try similar tactics on their own projects. The Arizona DEQ building in Phoenix, completed in July 2002, was designed to be LEED certified and is expected to achieve either certified or silver level. The building is very energy efficient – utility bills have been about \$1.16 per square foot versus about \$1.50 per square foot for a conventional Phoenix-area building built in the same year. In addition, the local utility installed a 100 kW photovoltaic on the roof of the parking garage to demonstrate renewable energy. The building has performed very well as an efficient building, a useful showcase, and an educational tool.

The California EPA Headquarters building completed in April 2001 in Sacramento was widely considered a success despite the fact that it was far along in the design process before it was determined that it would be a green building showcase. The greening of this project was driven by the values of the future tenant. Also in California, support for

green buildings increased as a result of the positive experience of the Capital Area East End Office Complex, which received a LEED Gold certification at no additional cost. This building demonstrated lower energy costs at a time when energy prices were at an all time high. The state of Colorado has registered its 40,000 ft² addition to the Colorado Department of Labor and Employment facility, which has benefited from a \$25,000 grant from the State Energy Office for sustainable design services. In Maine, the state-owned Baxter School for the Deaf has completed a green academic facility of approximately 10,000 ft² that serves the needs of hearing impaired adults and students. It features radiant heating, daylighting, reused materials, water efficient landscaping, water conserving plumbing and a white, reflective roof.

States with green building policies have demonstrated a commitment to assisting their agencies with implementing them effectively through programs like these, although some states are providing more resources than others to assist. How then, does a state know whether or not its agencies are complying with the requirements it has established and effectively implementing appropriate actions? The one element of a green building program designed to measure compliance with executive orders and legislation, Evaluation, is discussed next.

Element 4: Evaluation

The fourth element of a green building program is Evaluation. Evaluation can cover both program compliance and the effectiveness of the policy at the individual building level or overall. Sometimes but not always, policies explicitly specify how compliance should be measured or demonstrated and specify reporting and accountability requirements that program implementers must follow. Few states that were studied for this report included all of the four green building program elements, and evaluation appears to be the weakest component of state green building policies as a whole. The next section of this chapter describes the evaluation mechanisms adopted either formally or informally by states interviewed during this project.

In the case of green building policies in the United States, most evaluation approaches either reference or explicitly incorporate the U.S. Green Building Council's LEED Green Building Rating System as an evaluation mechanism and/or support tool. Some states require that all buildings become certified by the U.S. Green Building Council at a particular level (typically the Certified or Silver level). For example, California Governor Arnold Schwarzenegger signed Executive Order S-20-04 requiring LEED Silver certification for all state-funded "significant" (50,000 square feet, prototype or highly visible buildings with an educational purpose) new and renovation projects. Other states do not explicitly require certification but simply say that buildings 'shall meet the requirements for certification.' This is done for a variety of reasons such as to avoid the costs associated with formal certification, to make the policy more amenable to opponents of LEED, or to encourage a diversity of green building programs. An example where the lack of a certification requirement has been more explicitly stated comes from the U.S. Air Force, which has established a goal that all Military Construction projects by 2009 will be *capable of achieving LEED certification*, but do not have to be formally certified.

While most of the state mandates do refer to LEED, they do not all require LEED certification and some make allowances for what they term “or equivalent standard.” The Nevada law contains both provisos: “meet the requirements to be certified at or meet the equivalent of the base level or higher in accordance with the LEED Green Building Rating System, or an equivalent standard.” In addition to LEED, some policies provide for the possibility of using an alternative rating system instead. One alternative being considered by some agencies is Green Globes, an online auditing system for green buildings just emerging into the marketplace in the United States. Other state policies specify that it is acceptable to use LEED “or equivalent,” and go on to operationalize what attributes constitute an equivalent policy or to establish a task force to develop or select an appropriate set of guidelines. This is what the Nevada legislature decided to do and now the Director of the Office of Energy is in the process of working with a task force to select the standard that will be put in place. Many states, as well as federal and local government entities, have realized that LEED is not necessarily a perfect match for their building types and contexts, and have developed application guides (such as those under development in Pennsylvania and Colorado) or variants on the basic LEED framework to better meet their state goals.

The most straightforward evaluation method identified in this study is to require certification by the USGBC for all buildings covered by the directive. This creates a clear metric with little administrative burden on the state government for ensuring compliance, but it does put a lot of responsibility on the agencies managing the capital project process. Even policies that require certification have a weakness in their ability to ensure compliance with the policy because none of the EOs or laws reviewed in this study included provisions for enforcement. Time and time again, interviewees stated that compliance with the policy was left to the discretion of the individual agencies and that the only real lever in place to encourage compliance was the desire of agencies to maintain support of the Governor, legislature, or other body with power over their budgets and the ability to impact their future if they were seen as non-compliant.

Whatever the evaluation mechanism selected, the importance of evaluation as part of the policy is paramount to ensuring that the goals of the policy are being met. Yet careless specification and use of a rating system to get points for the sake of points can lead to less-productive buildings. Increasing evidence, including off-the-record remarks made during the interviews, suggests the possibility that highly rated projects under the LEED system may not always perform as expected, and some project teams are so eager to obtain points under LEED that they may pursue points that are not relevant or appropriate for their projects (Meyers 2005).

Many of the states in this study include requirements that agencies regularly report their activities with regard to green buildings as a way to measure compliance and overall program effectiveness. In many cases, this also entails reporting specific data periodically and consistently, which is helpful in monitoring progress. Colorado’s EO contains a requirement that all state agencies give an annual report to the Greening Government Council enumerating all their accomplishments related to the EO and including data on

the savings from those measures. In other states, the reporting requirement is given to one agency tasked with overseeing the program. For instance, the Maryland Green Building Council has to produce an annual report to the Governor and to the General Assembly on the efforts of state agencies in the implementation of all the sustainability issues from their EO, including *inter alia* green buildings, clean energy procurement, and greenhouse gas reduction. Similarly, Arizona's EO requires that the Departments of Administration, Transportation and School Facilities Board submit an annual report of their progress toward the 10% renewable energy goal along with a justification if they have not met the goal. Likewise, Pennsylvania's EO tasks the Department of Environmental Protection with compiling an annual report on the progress of all the commonwealth's agencies in reaching their goals set forth in their respective Green Plans.

In order to measure the effectiveness of their green building programs, some states require that agencies track the savings from their facilities and set up processes for making programmatic changes based on that data. In addition to applying LEED to existing and new construction, Colorado directs all agencies to monitor their utility costs and consumption by project. Washington State requires public agencies and public schools to monitor and document ongoing operating savings resulting from major facility projects designed, constructed, and certified as green buildings on an annual basis. The state also stipulates that a legislative audit and review committee must perform an extensive review of the costs of implementation, operational savings, impact on performance and productivity, effectiveness of the standards, and recommendations by the end of 2010.

Evaluation of policies themselves can include provisions for periodic review and updating of the policy over time and requirements for periodic reporting and accountability, as mentioned in the previous subsection. Although funding may not be specifically provided for these activities in the policy, other resources such as grants and/or partnerships with universities can often be tapped to conduct these studies and monitor progress toward policy goals. Together, these elements combine to achieve change in public agencies toward the goal of sustainability through green building. The state programs evaluated in this study present a wide range of green building policy and program options that can assist Georgia policy makers in developing a policy and/or program that is likely to succeed. The last section of this chapter, Lessons Learned about What Works and What Doesn't, summarizes specific lessons learned throughout the course of this study about how to avoid pitfalls that may result in an ineffective program.

Lessons Learned about What Works and What Doesn't

As Georgia investigates options for promoting green building among state agencies, it will be important to pay attention to the factors identified during this study that either hinder or enhance program success. The states evaluated in this study are in various stages of implementation of their green building policies and the two states (Washington and Nevada) with actual legislation have only just begun implementing programs to ensure compliance – both laws were passed in mid-2005. The lessons learned about effective state programs during the course of this study have been divided up into two

broad categories – those things that serve as barriers to a successful state-wide green building program (i.e., inhibitors) and strategies to improve the rate of success (i.e., enablers). The following subsections describe these lessons in greater detail.

Inhibitors

It is as important to understand inhibitors to implementing a successful state-wide green building policy or program as it is to understand the components that make a program successful. By understanding the challenges that other states have faced, Georgia is in a better position to evaluate its current context and anticipate the particular challenges which it will need to be prepared to address. This then provides a basis for knowing what types of action and policies are most likely to succeed in Georgia at this time. The next sections describe three broad categories of inhibitors identified in other states, including opposition to LEED certification, cost impacts, and resistance to change.

Opposition to LEED Certification

People generally agree that green building is a good idea, but not everyone agrees about what makes a building green, how green it should be, or how one can know if a facility is green (or at least greener than average). The most widely accepted green building rating system in the U.S. is LEED. The documentation required for LEED certification is often perceived to be cumbersome, and there are costs associated with registering a project, meeting documentation requirements, and obtaining certification. Without actual certification, though, it is possible for a building owner to claim that a facility has met the requirements of LEED certification when in fact it has not. Without some kind of third party verification or certification, there is no good mechanism to monitor whether the design and construction strategies truly measure up to the requirements. There are definite advantages and disadvantages to requiring LEED certification for state agencies. While it is impossible to please everyone with a state-wide green building policy or program, it is important for green building advocates (whether attempting to require LEED certification or not) to address opponents up front.

In each state, while the specific industry opponents may vary, it is probable that there will be some opposition from industry lobbies. A good example of this opposition and a creative way for dealing with it comes from the state of Washington. In this case, the forestry industry was opposed to LEED requirements because of a credit that awards a point if 50% of the wood used on a project is certified by the Forest Stewardship Council. This standard is considered by many to be more stringent than the industry's own Sustainable Forestry Initiative requirements. The state of Washington has its own regulations that govern forestry practices.² The language of the green building law that was passed requires that wood from forests regulated by the Washington Forest Practices Act be credited when state agencies adopt mandatory LEED certification. The specifics of how this will be implemented, since the USGBC does not allow such exceptions, have not been specified. However, this will not pose a significant problem in most cases unless a facility is one point away from earning LEED Silver certification and has met the

² <http://www.dnr.wa.gov/forestpractices/rules/>

requirements of the Washington Forest Practices Act. When this occurs, Washington will need to have a mechanism in place to ensure that the state agency is not penalized.

Other states have experienced opposition from industry groups as well. Those opponents tend to come from organizations such as the Resilient Floor Covering Institute over the lack of provisions in LEED for vinyl as a green flooring material, and other trade associations representing other plastics and refrigerant manufacturers. As LEED evolves (version 2.2 is now in the ballot stage), so too will the list of groups that support and oppose it.

It is not just industry groups that oppose legislation requiring LEED certification. State agencies often oppose certification because they believe that the cost of certification outweighs the reward of receiving a plaque, particularly if they are already designing to LEED standards. These people generally feel that the most important reward will be cost savings associated with green design. States have found different ways to address these concerns. In Pennsylvania, the GGC is developing a Total Quality Management-based system that reduces the administrative burden on agencies associated with LEED certification. This will involve the implementation of some type of building audit procedure to ensure that LEED design and construction principles are followed. Several states have chosen not to require LEED certification, but admit that ensuring LEED principles are followed is difficult in the absence of certification. In some states, if funding is not going to be provided to pay for certification, there is strong opposition to requiring it.

The state of Nevada experienced opposition to requiring LEED certification by the Green Building Initiative, the licenser of Green Globes, since it is an alternate green building rating system that could be used instead of (or in conjunction with) LEED. As a compromise to LEED opponents, the language of the legislation requires that LEED “or equivalent” be used. A council has been established to recommend which standard should be endorsed by the state.

Opposition may arise from other groups, such as those who have developed their own rating systems for a specific building type. Again in Washington, K-12 school systems had developed a green building guide for schools based on the Collaborative for High Performance Schools rating system and did not, therefore, want to be required to use LEED, which is less school-specific. As a result, the legislation in Washington allows the use of the Washington Sustainable School Design Protocol instead of LEED for school facilities.

Another barrier to requiring LEED certification is that the rating system does not provide the flexibility desired by some state agencies. Although LEED is considered by most to be a good green building rating tool, it does not ensure that a building performs well when completed. When buildings are designed to maximize the points earned under LEED without consideration of the appropriateness of the strategies used, the result can be a poor performing building with a deceiving accolade. Unfortunately, reports of LEED

certified buildings that do not meet performance expectations have soured some people on LEED completely (e.g., Meyer 2005, Stein and Reiss 2004).

Another inhibitor to green building (LEED or otherwise) may arise when a green product fails in a spectacular way or simply fails to meet performance expectations. For example, one architect designed men's restrooms in a state agency office building with high efficiency waterless urinals manufactured in Australia. When components of the urinals needed to be replaced, however, they were difficult to obtain, resulting in skepticism among operations and maintenance employees and policy makers about the value of green buildings in general based on a bad experience with one technology.

Cost Impacts

Whether an increased first cost of construction is real or perceived, cost is one of the biggest inhibitors to green building (with or without LEED certification). In Arizona, agencies and their design contractors were concerned about how much additional cost or schedule time the EO would require. In Pennsylvania, one of the greatest barriers to green building is the misconception that green buildings must cost more to construct. There are some agencies with a "low bid" mindset that creates resistance to green building. In Colorado and other states, the cost of commissioning, which is required under LEED, has been a barrier due to the lack of understanding regarding the value it offers versus the cost to commission. Agencies that create affordable housing in Washington also opposed LEED based on their perception that green housing construction will cost more and therefore conflicts with their goals.

Another cost impact felt by some state agencies is that they lack the resources (both time and money) to properly support green building programs; unfunded mandates by the state present a cost barrier for program implementation. In New York, there was a general resistance to implementing its green building EO because it was then considered to be a somewhat radical idea that had no additional funding provided to cover what stakeholders perceived as additional effort. In most states evaluated, the states have only a handful of employees who are available to provide technical assistance or training for agencies and other groups in the state pursuing green building. In Nevada, there is some uncertainty regarding how colleges and universities will meet the new law's requirement that they educate students about green building to prepare them to become LEED accredited professionals when there is no funding for this task.

In states that provide tax abatement incentives for projects that achieve a specific green building guideline, municipalities may oppose it since this directly influences their revenue streams. Of course, tax incentives apply to private developers rather than state agencies, but any state policy that includes these types of incentives may encounter this opposition.

Additionally, while the biggest selling point of green building tends to be the cost savings that will be realized during the operation and maintenance phase of a building life cycle, there are no mechanisms in place in any of the states evaluated that allow state agencies to have access to money saved in operations for other needed capital projects. Agencies

cannot borrow from their savings to pay for capital expenses. Agencies are typically not rewarded for reducing operating expenses in the facilities they build, and may actually be penalized by reduced operating budgets in subsequent budget cycles, thus deflating the value of the most compelling argument in favor of green buildings.

Resistance to Change

Humans by nature are resistant to change, and this can be especially true in the building industry where liability is a serious issue. Sometimes resistance to green building practices is based on a lack of understanding and sometimes it is based on past experiences. In Maine, for example, it was reported that some building contractors objected to the state's green building policy, stating that it would cost too much to implement the LEED process in construction. Further, there appeared to be a fear of trying new things based on bad experiences with innovative products in the past, such as asbestos insulation, which later proved to be a poor choice and an expensive mistake. There is also considerable fear that adding green elements to a project will negatively impact the budget and the schedule. In Colorado, the Department of Labor and Employment received an approval to proceed with LEED certification on a project with a warning up front that the greening effort would not be permitted to impact the schedule or the budget. It was a big win for green building support in Colorado when the building was completed ahead of schedule and within budget, and still earned LEED certification.

In addition to the opposition to change within an industry, another change-related barrier occurs when an administrator (such as the Governor) changes and the new administrator does not share the priorities of the previous one who put a green building policy in place. Executive orders in particular are susceptible to political upheavals and can easily be revoked or overridden to allow the new administration to make its mark. The momentum created by an EO may wane in the years to follow if these policies and practices are not institutionalized and routinized before a new administration takes office. Further, it may take some time to educate a policy maker about the capital project process because it is not often something about which they have much knowledge and experience. Therefore, once the new leadership is in place, green building advocates may have to begin again in educating the administrator about the benefits of green building.

Although these factors represent challenges that are commonly cited as impediments to green building programs, they can be offset or otherwise addressed by taking advantage of other factors that enhance or enable the green building process. The next section, *Enablers*, describes specific characteristics of state green building programs and their contexts that facilitate effective implementation in practice as identified in this study.

Enablers

While there were no big surprises uncovered in this study regarding factors that help ensure the success of a green building policy, the interview data suggest that there are three major categories of enablers that help ensure that a green building policy is successful. These include the presence of strong champions, the ability of a state to capitalize on external motivators, and the development of broad-based stakeholder support. The following subsections describe each of these categories of enablers in turn.

Presence of Strong Champions

It is unlikely that a formal green building policy will ever be successfully passed or implemented without a strong champion in a position of power or authority. Champions do not need to be high ranking, but the findings of this study do support the notion that one of the most critical factor for success is having a high level internal champion willing to take risks to promote green building. For instance, the passage of the law in Nevada occurred because of the presence of green building champions in both houses of the legislature.

While legislation is more difficult to pass than an executive order, it is capable of becoming more all-encompassing and requires champions at high levels. Higher ranking persons may have more success in facilitating the passage of green building policies, but it is also important to build support within state agencies and among other stakeholders before issuing an EO or passing a green building law to ensure successful implementation. In Maine, for example, it was vitally important that the Office of Buildings and Maintenance had an internal green building champion. Supporters in critical job positions within agencies who handle real property for the state are invaluable for promoting sustainability.

Capitalizing on external motivators

Support for green building programs can also arise from things not within the control of change agents. Even though they cannot be planned for or controlled, it is often the external context which influences the interest people have in green buildings and whether or not green buildings are seen as important and beneficial. Crises or situations of need or failure require people to look for solutions. While no states cited crises as the cause for creating their green building programs, several did credit crises with drawing attention to the benefits afford by sustainable design and thereby generating support for the programs. Instances where this was the case include California, where the opening of the demonstrably energy efficient East End project coincided with a high point in the energy crisis. As a result, the project was well positioned to receive positive press and draw the attention of state agencies that may not have previously been as interested in pursuing green building strategies. Several other states capitalized on the synergy between the need for a new state agency building and the early stages of a green building program, using this as a chance to create an early win and demonstration project. This strategy has been most successful when the agency in need of a new building has a mission including resource conversation, such as in Arizona and Pennsylvania.

Building stakeholder support

The path to successful development and implementation of green building practices by state agencies is paved with inspiration. This study confirmed that states can facilitate the growth of sustainable design and construction by supporting a wide range of green building activities that apply to public and private sectors alike. Regardless of how it is achieved, it is vitally important to build broad-based support among building stakeholders, both in the public and private sectors. To achieve this end, agencies have worked diligently to remove opposition, provide training and technical assistance,

implement demonstration projects, and encourage private sector development, as described in the following subsections.

Removing Opposition: Resistance from industry groups, agency staff and the building community can be detrimental to the passage of a green building policy as well as to the ultimate success of a green building program. It is critically important for a state to build broad-based support among a diversity of building stakeholders in order to lessen the impact of opposition. The likelihood of passing a law, for example, is much greater when there is a proactive approach to removing opposition and answering questions sufficiently to turn opponents into proponents. For example, in Nevada, the Association of General Contractors is a very strong lobbying group that originally opposed a state green building bill. Providing more information to the Association motivated it to remove its opposition to the bill, and it now fully supports the legislation. The first attempt to pass green building legislation in Washington was not successful. It was necessary to work with opponents, such as the wood products industry and school systems, to create a bill that was amenable to them. New York State had to defend its position of excluding vinyl floor covering from its green building tax credit in a suit brought by the Resilient Floor Covering Institute. They were successful enough in making their case that the Institute dropped its suit.³ The green building program in California has benefited from bringing in numerous stakeholders, such as government officials and contractors, in order to distribute the risk, addressing the construction industry's tendency towards risk aversion and concern with liability. For successful implementation of a policy, it is critical to involve agencies that will be affected by the policy early in the discussions. Opposition to the green building policy in Maine could have been significantly reduced if the state had worked more closely with school districts prior to passing their executive order.

Supporting Technical Assistance and Training: Training can be an important tool for removing opposition, but is perhaps even more important for ensuring that agency staff and their design and construction teams are equipped to succeed in building green facilities. Training and technical assistance may be provided by state employees, contracted through the state via private entities, or paid for by providing grants to agencies and allowing them to hire their own experts to provide these services.

For instance, Colorado sends agency staff to external training courses to provide them with the interest and ability to demand green buildings from their design and construction teams. For technical assistance, Colorado found that giving grants to state agencies to allow them to hire outside technical experts was more effective than the state's previous method of providing technical assistance directly through the state energy office. There are two benefits to this new approach: getting the agencies the help needed to make buildings more sustainable, and supporting the market of competent experts thereby building capacity. An additional element of Colorado's grant program is that the Office of Energy Management and Conservation has one staff member dedicated to working with all of the grant recipients to document successes and lessons learned, and to share these lessons with others. In Pennsylvania, where the GGCC provides technical assistance to state agencies, training, education, and outreach are critical to the success of

³ http://www.healthybuilding.net/pvc/NYS_vinyl_affidavit_js.pdf

green building efforts. In collaboration with the Department of Environmental Protection, the GGGC works as a catalyst, creating partnerships and networks to connect people with information, knowledge, and experts in the field. Without these supporting pieces to build support and capacity, the programs in these states would not be nearly as successful.

Demonstrating Success: Often, an agency is unwilling to attempt green building until another agency successfully designs and constructs a facility that sets an example or precedent. Having a successful green building that can be used as a demonstration project is an excellent method for overcoming uncertainty and building support. In some instances, states have used buildings that were built prior to the establishment of an official green building policy to generate support. In others, demonstration projects may have been the first buildings that are completed under the new policy. In any case, the key to success is taking full advantage of these success stories to promote the advantages of green buildings and minimize the fear of the unknown. For instance, Arizona not only gives many tours of its Department of Environmental Quality building but it also has compiled impressive data to support claims of energy savings. In other words, they provide solid evidence to demonstrate how well the building looks and functions. This kind of information helps to allay people's fears and confirm the benefits of green building. To have the most impact, it is important that the demonstration projects are highly visible large projects. California's experience was similar to Arizona – they had two large projects in the capital city that received good press and showed demonstrable operational savings, and as a result the green building program garnered support from other agencies.

Promoting Private Sector Green Building Activities: Green building in the private sector can also have a positive impact on state agencies. Through private development, building professionals gain knowledge and experience that they can use on state projects. A discussion of specific private sector green building activities in states with green building policies is outside the scope of this study, but it is important to note that states can benefit in their own facility efforts from offering incentives for private green development to build industry capacity and from sending representatives to meetings of local USGBC chapters. In Arizona, like many other states, the local USGBC chapter is an important resource that can respond to questions from the Governor's office, host seminars, and boost support for green building. Years before New York State developed a policy for state owned buildings, it created a green building tax credit for private sector developers. The success of the tax credit policy certainly helped to create an atmosphere supportive of a more aggressive policy.

It is useful to understand the components that make up a good green building program and to capture the lessons learned from the experience of others before deciding the path Georgia should take. In looking at the experiences of other states, it is important to keep in mind that each experience is unique – what works well in one state will not necessarily work in another state. The next section of this report examines the Georgia's state capital facility process including a review of the major facility owners and stakeholders in state facilities in order to begin to understand the context in which a green building policy

would be implemented in this state. This analysis, along with a brief overview of green building activity in Georgia, sets the stage for the final section of this report where recommendations are made about the policy options Georgia may consider to green its state-owned facilities.

CHAPTER 3: GEORGIA'S READINESS FOR GREEN BUILDING

In order to meet the goal of recommending policy options to green state buildings in Georgia, evaluating the current state of the art of green building in the state is of paramount importance. This chapter provides an overview of Georgia's readiness and receptivity toward green building at the state level. It begins with an overview of why green building is emerging in the marketplace in Georgia as a significant trend, followed by a description of current capital processes in place for State facilities and notable policy trends and actions that have influenced those processes in recent years. The state of the art of green building in Georgia provides a summary of State-level policy initiatives, State Agency initiatives, and other non-state green building initiatives and incentives that presently exist in Georgia. The chapter concludes with a summary of findings and lessons learned from interviewing leading Georgia agencies who are presently doing or considering green building, and a description of what a green building program needs to succeed in Georgia.

General context – why green, why now?

As a state, Georgia faces both opportunities and challenges associated with rapid population increase, largely unchecked development centered on the metropolitan Atlanta area, and a growing economy based on industries as diverse as agriculture, textiles, and high technology. Coupled with this growth is a growing awareness of the true impacts of current development patterns, both in Georgia and beyond, along with the eventual constraints to which those impacts will lead if left unchecked. For instance:

- The metro Atlanta population was 4 million in 2000 and is expected to double by 2030.⁴
- Thirteen metro Atlanta counties are presently in serious nonattainment for ground-level ozone. While motor vehicles and other motorized items are responsible for much of this problem, 40% of ozone nonattainment has been attributed to fossil fuel-fired power plants in the region that meet its energy needs. The City of Atlanta does not meet EPA standards for hydrocarbons and photochemical emissions.⁵
- In the past decade, Atlanta has added 1 million people, and over 76% still drive alone. The average Atlantan spends 4,000 minutes per year commuting, and Atlanta has five times as many traffic fatalities as New York City.
- Emory University studies have linked urban sprawl with depression, obesity, asthma, and traffic fatalities.⁶ Across the United States, Phoenix is the only city

⁴ http://www.atlantaga.gov/citydir/DPCD/Bureau_of_Planning/BOP/CDP/

⁵ [http://www.cleanaircampaign.com](http://www.cleanaircampaign.com;); <http://www.southface.org>

⁶ <http://www.perimetergo.org/pr-ajc-062402.htm>

growing faster than Atlanta, which now covers nearly 15% of the total area of the state of Georgia.⁷

- Water demand is expected to double over the next 15 years in the State of Georgia. Georgians are already consuming water at projected 2030 levels during the summer, and are causing significant downstream impacts in water supply.⁸
- Georgians can expect Conservation Pricing measures for water in the near future, plus legislation requiring water conservation measures like low-flow fixtures.⁹
- Wastewater quantities are expected to double by 2030. Surface water quality does not meet EPA standards for designated use in 55% of stream miles in the Atlanta District. 93 miles of streams within the district do not meet requirements for any designated uses. Water quality problems include heat loads from stormwater runoff, combined sewer overflows, and non-point source loads.¹⁰

Georgia's statewide development goals reflect a recognition of these problems and respond in a positive fashion by highlighting the opportunities for sustainability in creating a more livable, productive state. These goals include¹¹:

- Achievement of a growing and balanced economy...that equitably benefits all sections of the state and all segments of the population
- Conservation and protection of environmental, natural, and historic resources
- Assurance that public infrastructure facilities...have the capacity...to support and attract growth and development and/or maintain and enhance the quality of life of the residents of the state
- Assurance that all people...have access to adequate and affordable housing
- Protect and promote the quality of life of the people of Georgia.

Metropolitan Atlanta, the state's largest urban area, also has development priorities that set the stage to support and align with the principles of sustainability¹²:

- To maintain an environment in which citizens, workers, and visitors feel safe and secure
- To provide services that are appropriate, cost effective, and responsive to citizens' needs
- To make Atlanta neighborhoods attractive, vibrant, and sustainable places to live, and the City a good place for business investment.

⁷ http://www.npg.org/states/statenews/ga_listserv.html#swells

⁸ <http://www.northgeorgiawater.com>

⁹ *ibid.*

¹⁰ *ibid.*

¹¹ http://www.atlantaga.gov/citydir/DPCD/Bureau_of_Planning/BOP/CDP/

¹² New Century Economic Development Plan for City of Atlanta. Available online from <http://www.atlantaga.gov/>

With the anticipated growth in population, economic development, and resultant impacts, the State of Georgia is poised to make tremendous progress toward development that meets the needs of its present citizens while maintaining and enhancing the ability of future Georgians to meet their own needs (adapted from WCED 1987). Both in public and private sector development, opportunities abound to develop more efficient and effective ways to meet human needs while minimizing consumption of increasingly scarce natural resources, reducing degradation or loss of critical ecosystems, and increasing the quality of human life.

Current Market Status for Green Building in Georgia

The market in Georgia for green buildings is on the rise and examples of LEED certified and other green projects are visible in both the public and private sectors. From capital projects to professional associations, there is a great deal of activity to promote sustainable design and construction. A few examples of Georgia-based green building activities include:

- Higher Education – In addition to construction activity within the University System of Georgia that will be discussed in subsequent sections, considerable activity exists within the university realm in general. Emory University (a private institute) has earned LEED certification for four of its projects, and has a formal policy to achieve a minimum of LEED Silver certification on all major construction projects. Green building is included at many levels throughout engineering, architecture, policy, and environmental science curricula at universities like Emory and Georgia Tech. Working groups among faculty such as the Healthy Places Working Group partnership in Atlanta are pursuing research to identify new methods of development that support and enhance human health and well-being. Professional development and continuing education courses are also offered by local universities as well as non-profits to diffuse green building concepts into the marketplace.
- Residential Construction – The EarthCraft[®] House program is a voluntary green residential program in place in the metro Atlanta area that is rapidly expanding its reach into other areas. This program has been developed by Southface Energy Institute, an active non-profit in the green building arena, in conjunction with the Greater Atlanta Home Builders Association. The certification program provides training and auditing to ensure that homes are healthy, comfortable, and energy efficient.
- Other Private Development – Private developers and building owners are embracing green design. Examples of LEED certified buildings include the Arthur M. Blank Foundation's Family Office and the Platinum Certified Interface Carpet Showroom in Atlanta, Melaver Inc.'s main office in Savannah, and the Southern Pine Conference Center in Pine Mountain.
- Professional Associations – There are some very active professional organizations that provide both educational and networking opportunities for building professionals and building owners. Examples include the U.S. Green Building

Council - Atlanta Chapter, the Sustainable Atlanta Roundtable, and the American Institute of Architects - Committee on the Environment.

- City of Atlanta Green Building Activities – In December 2003, the city passed an ordinance requiring that all new city owned buildings become LEED certified. Additionally, the city has invested in some additional green strategies, such as the installation of a vegetated roof on Atlanta’s City Hall building and a porous paving parking lot at the Atlanta City Jail and has undertaken extensive energy audits of its existing buildings to identify and take advantage of opportunities for significant energy savings.
- Industry Events – Atlanta is hosting the 2005 GreenBuild International Conference and Expo, the largest international green building conference in the world at this time. Regional initiatives such as the annual GreenBuild Conference have expanded to draw national participation, and awareness of green building is rapidly propagating throughout the construction sector in Georgia.

While this list is certainly not comprehensive, it does indicate that the climate for green building in Georgia is healthy and growing. Considerable capacity exists and is being continually added and enhanced in the private sector, both by formal programs such as EarthCraft and continuing education programs, and informally through networking events and discourse in professional forums. The active programs already in place in the state can provide considerable support for efforts to increase the level of green building among state-owned capital construction projects.

Current Practice for Construction of State Buildings in Georgia

Within the State of Georgia, economic development and population growth have resulted in a construction market that is robust and continually evolving. The joke about the state bird of Georgia being the crane – the *construction* crane – is as true today as it was in the early 90’s, with projects as large as the 138 acre Atlantic Station infill redevelopment lining the Atlanta skyline with new towers even as the infrastructure underfoot (such as stormwater overflow systems) is being revitalized. The State of Georgia alone spends between \$600 million and \$1 billion annually on capital projects, with a current inventory of over 12,000 facilities and the second largest consolidated funding volume of public construction in the United States behind the federal government (Commission for a New Georgia 2004b). This section explores the processes, policies, and state of practice that currently characterize state capital projects in Georgia and provide the foundation for government and its services and activities in the state.

The State of Georgia Capital Project Process

Initiation of a state-owned capital project in Georgia begins with identification of a need for a facility at the agency, commission, or authority level (hereafter referred to as agencies). Presently, if projects are to be financed using state funds, facility needs compete within agencies for priority by submitting requests to the Office of Planning and Budget (OPB) within the Governor’s Office. Various other funding mechanisms are available for projects, including private funding and agency-level funding, and projects

rely on these funding sources to varying degrees depending on the resources available to the agency requesting the facility. For those agencies seeking to fund their projects through capital outlay, a program of requirements and funding request is prepared and submitted for an annual review and prioritization process following the format and submittal requirements provided by OPB.

When funding is secured for a project, agencies proceed with design for that project while drawing upon the expertise of the Georgia State Finance and Investment Commission (GSFIC), who will ultimately be responsible for construction. Georgia resembles several other states in that this central agency typically handles the construction phase of state projects and supports planning and design as well. While not all agencies are required to use the services of GSFIC due to constitutional powers, most either use GSFIC's services and/or support at some point in their process, or build on resources such as the State Construction Manual – managed by GSFIC – to develop their own customized approaches. Agencies that do not use GSFIC's services but instead manage their own construction processes include the Georgia Building Authority, which is responsible for most of the facilities used by state agencies in the state capital of Atlanta, the Board of Regents (responsible for the University System of Georgia), the Department of Natural Resources, and the Department of Transportation that operates and maintains all state-owned transportation infrastructure. Figure 3.1 (Daniels & Abraham 2005) shows the various paths Georgia state agencies can use for constructing state-owned facilities in Georgia.

Georgia's Current Inventory of Capital Facilities

Georgia's inventory of existing buildings is extensive – as of the most recent tally in 2003, over 12,000 buildings were in the state property inventory, not including vacant properties and projects under construction. 180 projects are currently underway through GSFIC, according to the Georgia 2000 Information System run by the Carl Vinson Institute of Government at the University of Georgia.¹³ Figure 3.2 shows the distribution of buildings by owner in terms of total number of buildings, while Figure 3.3 shows the same distribution by total building insured value, based on the 2003 Annual Georgia Building Inventory Report (Evans 2004). A distribution of buildings by top five uses is included in Figure 3.4 (ibid). Building uses included in the "Other" category range from moving target simulators, monuments, and oxygen refill stations (Department of Defense) to greenhouses and laboratories (Board of Regents and others) to dock facilities, pump houses, dormitories, and cottages (Department of Natural Resources and others).

¹³ <http://www.georgia2000.org>

Figure 3.1: Paths to Constructing State-Owned Facilities (Daniels & Abraham 2005)

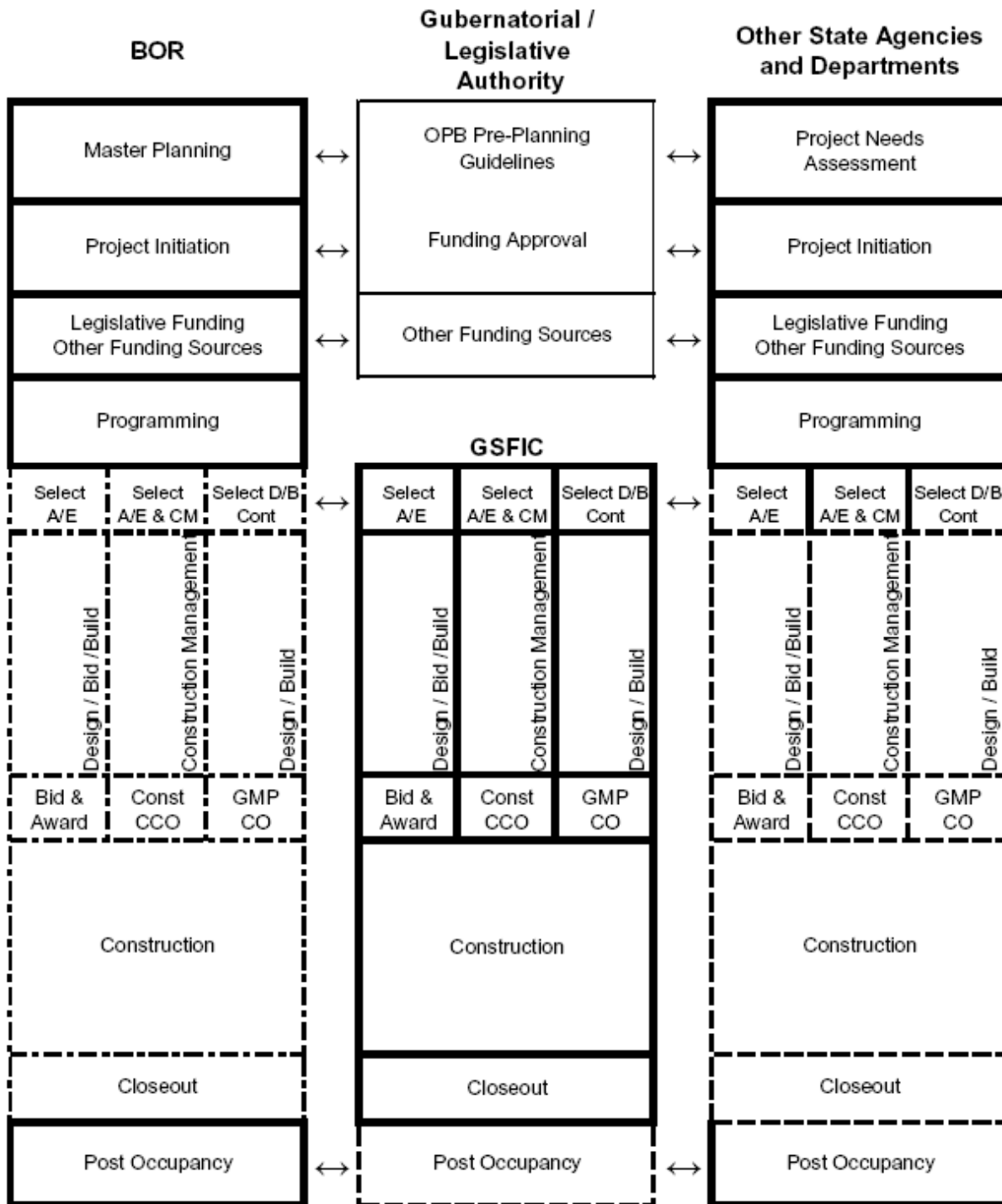


Figure 3.2: Distribution of Buildings by Owner - Number of Facilities (Evans 2004)

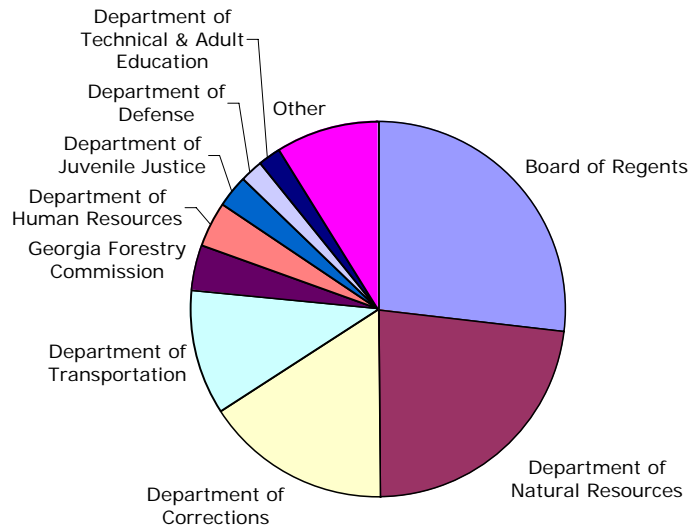


Figure 3.3: Distribution of Buildings by Owner – Insured Value (Evans 2004)

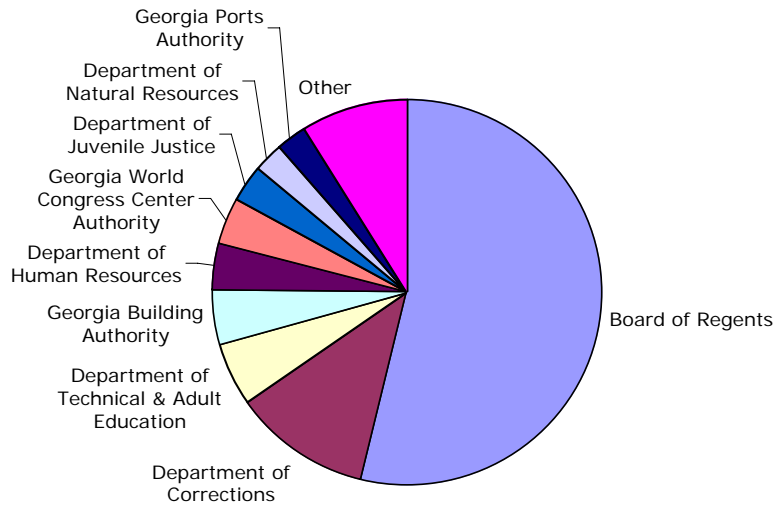
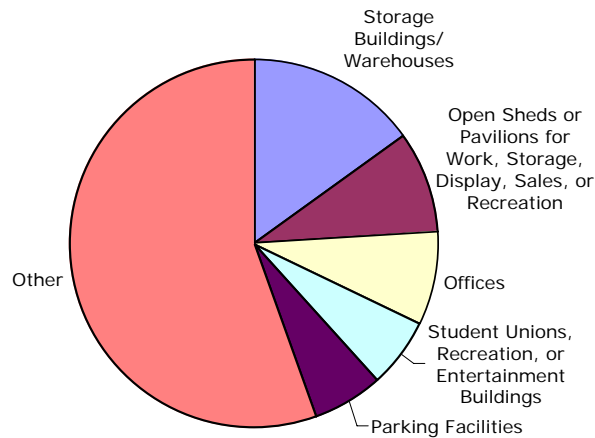


Figure 3.4: Distribution of Buildings by Use Category (Evans 2004)



Developments in the Capital Project Process

Several recent developments in Georgia have had considerable influence on how state capital projects are planned, funded, designed, constructed, and operated/maintained. These include the following:

Senate Bill 158 – This legislation, passed in 2005, required that all state agencies submit inventories of their capital facilities on an annual basis to the General Assembly. The custodian of this data is the Georgia Building Authority, which is presently evolving an improved mechanism for ongoing capture and maintenance of that data. Data collected as part of the inventory include building name, location, party responsible for building operation, square footage, occupancy, building use, fair market value or replacement value, attributes of major building systems and expected service life, building age, historical significance, accessibility, and energy consumption and utility connections/usage. This bill is a first step towards managing Georgia’s state-owned and leased capital facilities from a portfolio perspective.

Commission for a New Georgia’s Capital Construction Task Force – As part of Governor Sonny Perdue’s ambitious initiative to make Georgia the best managed state in the nation by 2007, a Commission for a New Georgia was established in 2003 as a public-private partnership to examine Georgia’s state government policies and practices and identify areas to increase efficiency and effectiveness. One of the Task Forces created as part of this effort focused on the state’s capital construction processes and

generated findings and recommendations in its final report in 2004. The Capital Construction Task Force took a state-wide perspective to identify key opportunities to improve processes that are presently undertaken by multiple agencies, commissions, authorities, the Board of Regents, and the Department of Transportation. Findings of the Task Force with respect to then-existing practices included (Commission for a New Georgia 2004a):

- 1) Capital projects were undertaken in a decentralized manner, with multiple entities being responsible for capital management, and considerable redundancy across roles, resources, and processes.
- 2) Within and among these entities, there was considerable variation across policies and procedures, and varying levels of expertise across agency professionals.
- 3) State facilities were subject to maintenance backlogs, underutilization, and lack of investment in capital renewal, resulting in declining portfolio value.

In short, state facilities were not being managed with respect to a coordinated “enterprise-wide vision” that could maximize the effective use of capital assets to meet government needs. The Task Force developed three overarching recommendations, along with details of proposed implementation and a work plan for each, as follows (Commission for a New Georgia 2004b):

- 1) Establish a Chief Property Officer with a more streamlined functional structure to support capital construction activities.
- 2) Evaluate liquid and tangible assets for reallocation and divestment.
- 3) Develop end-to-end process management policies, procedures, and tools for the selection, acquisition, and development of capital construction services.

The findings were aimed toward improving the process used by the State to manage large capital projects, thereby saving both time and money while delivering facilities to meet State needs. The Task Force also identified four guiding principles for capital construction in the state which should guide decision making at all levels of state government (ibid.):

- 1) The entire cost of ownership for the life of a facility should be determined and planned for as part of the funding approval cycle.
- 2) Construction and ownership of non-special purpose facilities should be avoided in lieu of leasing wherever possible.
- 3) Every attempt should be made to improve and utilize existing space inventory before new construction is approved.
- 4) Investment in non-metropolitan areas for building and/or leasing facilities should be considered in order to reduce operating costs.

These principles set the stage for good capital investment decisions in alignment with sustainability objectives, and are currently being adopted and propagated throughout state organizations responsible for capital facilities.

Executive Order 01.12.05.02 – This Executive Order, signed by Governor Sonny Perdue in January 2005, was based heavily on the recommendations of the Commission for a New Georgia’s Capital Construction Task Force. The EO mandates action in four areas:

- 1) It establishes a State Property Officer within the Executive Branch who is responsible for statewide capital asset portfolio management, including inventories of existing assets and current and future space needs.
- 2) It establishes a seven member advisory council to support the State Property Officer and requires that agencies submit an inventory of surplus and underutilized facilities to that office.
- 3) It mandates that the Office of Planning and Budget consider the total cost of ownership in funding state projects and support pre-design costs of projects.
- 4) It orders the development of a State Construction Manual.

Combined with the underlying study and findings by the Commission for a New Georgia, this Executive Order sets the stage to support an increased level of green building among state entities in Georgia as well as building supporting market capacity for improved capital construction methods statewide. All activities mandated by the EO are presently underway, with the revised State Construction Manual to be brought online in January 2006.¹⁴ The context for change has been established in the processes associated with capital construction of state facilities, and the attitude of most stakeholders toward innovation is positive. The next section of the report describes how green building has evolved within the state concurrently with these capital project and process innovations.

State of the Art of Green Building in Georgia

Over the past ten years, interest in green building has grown exponentially in Georgia, with Georgia presently being home to the state agency (the Georgia Department of Natural Resources) with the largest number of LEED registered or certified buildings (nine) in the country as of the time of this writing (Freedman 2005). Atlanta, the state capital, consistently ranks in the top ten cities for LEED projects in the U.S.¹⁵, many of which are affiliated in some way with public sector construction. A variety of initiatives and programs related to green building are underway in Georgia. From state-level policy initiatives that have laid the groundwork for green, to voluntary initiatives within state agencies and authorities, to state agency programs dedicated to supporting green building in both the private and public sectors, the number of state programs involved in promoting and supporting the goals of green building is extensive and ever-growing. The following subsections describe these activities in more detail.

State-level Policy Initiatives

The notion of a policy directed toward greening state-owned facilities is not new in Georgia. The current governor, Sonny Perdue, has shown support for green building in several ways, including declaring a 2004 Green Week in the state during that year’s GreenPrints conference and emphasizing natural resources, energy, and environment as

¹⁴ <http://www.usg.edu/ref/project/>

¹⁵ <http://www.greenbuildexpo.org/>

key sectors for support in the state through initiatives such as the Georgia Land Conservation Act.¹⁶ However, as of yet, efforts to enact a green building policy for state-owned facilities through legislation or executive order have not been successful. The following subsections describe three such efforts, along with an examination of why they may have not been successful.

Senate Bill 137¹⁷, known as the Cool Roof Bill, was first introduced in February of 2003. A substitute bill was later introduced and received a favorable review from the Senate Committee in February, 2004, but this bill was never passed. In order to reduce significant urban heat island effects and to reduce cooling loads in state buildings, the bill would have required an amendment to the Official Code of Georgia (annotated) to ensure that all replacement roofs installed on or after the effective date of the bill meet one of three requirements:

- 1) Use Energy Star[®] certified roof products
- 2) Are certified as complying with LEED heat island reduction standards for roof design; or,
- 3) Meet or exceed ASHRAE 90.1 standards for cool roofs.

The policy as written did not provide any exclusions, even for historically significant buildings with architecturally prominent roofs such as the state Capitol Building with its famous gold dome, and it provided no mechanisms to address the fact that it is perhaps not practicable to replace all roofs with a more “cool” roof option. Further, the second criterion is incorrect, as the USGBC does not certify compliance with heat island reduction standards for roofing design. Rather, a project may earn specific points towards certification when using the LEED green building rating tool if the roof design includes highly reflective materials and/or vegetated surfaces. During interviews the Bill was portrayed as naïve and inflexible and seemed to have been introduced spontaneously without having built prior support among the people who would ultimately have to implement it. The proposal to put cool roofs on some state buildings was not categorically opposed, but making it a requirement for all buildings was not acceptable. The Bill may have been more successful if key stakeholders had been brought into the process and given the opportunity to create a bill that was viable using a consensus process.

House Bill 127¹⁸ is a piece of legislation that was introduced in January, 2003 to amend the Official Code of Georgia to require that facilities built with state funds (wholly or partially) seek LEED certification to the extent practicable. The language of the Bill makes it unclear exactly what was to be required and reflects a limited understanding of how LEED certification would be applied. For example, the Bill mandates that the state shall “seek LEED certification at the earliest stage of development...and throughout the

¹⁶ http://www.gov.state.ga.us/issues_gov/index.shtml

¹⁷ http://www.legis.state.ga.us/legis/2003_04/versions/sb137_Committee_sub_LC_25_6.htm

¹⁸ http://www.legis.state.ga.us/legis/2003_04/versions/hb127_LC_22_4966_a_2.htm

life of each such building,” yet certification is typically a one-time event after the facility has been completed and occupied.¹⁹

The HB 127 does not provide any exemptions to the law, except for a clause stating that LEED standards should be followed to the “extent practicable.” Since many state facilities fall into unusual categories such as pavilions, moving target simulators, monuments, oxygen refill stations, pump houses, or docks, requiring adherence to a standard that is not well-adapted to these building types is likely to engender considerable resistance, which is in fact what happened. The Bill was also unclear about who would bear costs of formal certification if such certification were indeed required. Most importantly though, the Bill was written and introduced without a broad base of support behind it to promote it to other legislators and consequently the HB 127 was never passed.

The most recent effort for green legislation was a **Proposed Green Pilot Project Executive Order**. In 2004, a coalition of industry leaders representing the Association of General Contractors (AGC), the American Institute of Architects (AIA), and the American Council of Engineering Companies (ACEC) presented a proposed plan for greening state buildings to State of Georgia Chief Operating Officer Jim Linds. The proposal came on the heels of a successful gubernatorial proclamation of Green Week in Georgia during the 2004 GreenPrints Conference. The plan recommended that green building strategies be introduced to state agencies by requiring that: 4-5 selected projects be designed, constructed and certified using LEED; the Governor appoint a Sustainable Design and Construction Council; and that this council would oversee the evaluation of the pilot projects and advise the Governor on a sustainable facilities policy for Georgia. Ultimately while the recommendation had faced no real opposition, enthusiasm for the measure waned and no decisive action was ever taken.

Based on lessons learned from these prior efforts, key factors affecting the success of formal green building policies for Georgia include the need for reasonable exclusions or exemptions if a referenced standard is included, clarity and accuracy in language in order to prevent ambiguity in implementation, and broad support from key stakeholders. Future policy efforts for the state should be designed to take these factors into account in order to maximize the chances of success and broad acceptance.

State-level Agency Initiatives

While there is presently no state-level formal policy requiring state agencies to construct green buildings, green building has varying levels of recognition and adoption within Georgia state government. Several agencies have constructed pilot green buildings that have received or are seeking formal certification under the LEED Green Building Rating System, while others have incorporated green building technologies and strategies into their projects in less formally recognized ways. One agency (the Department of Natural Resources) even has an internal formally stated green building policy. Whatever their

¹⁹ Registration of projects with the USGBC is, however, typically undertaken in the very earliest stages of the project to clarify intent of goals to achieve LEED certification and to provide the project team with access to LEED resources on the USGBC web site.

level of involvement, Georgia agencies in general seem to be receptive to the business case for green building, and are undertaking a variety of voluntary initiatives to “test the waters” of sustainable design.

This study examined the green building practices of six of Georgia’s top facility-owning state agencies, boards, authorities, and departments that have experience with green building projects. The study used a series of interviews with key stakeholders in each agency to identify what each of these agencies is presently doing with respect to green building, what has motivated those actions, what agencies plan to do in the future, and how they believe a green building policy might be most effectively implemented for state buildings in Georgia. The following subsections describe the state of the art in green building practice for each of the six owner agencies interviewed. Additional interviews were conducted with the Georgia State Financing and Investment Commission and the Governor’s Office of Planning and Budget to provide additional perspective on the state’s capital outlay and construction processes, and the findings from these interviews are combined with lessons learned from Georgia owner agencies to formulate recommendations in the final chapter of this report.

Board of Regents

The University System of Georgia (USG) Board of Regents (BOR) was created in 1931 to oversee and serve Georgia’s 34 public colleges and universities. The USG’s vision is to “...create a more educated Georgia, well prepared for a global, technological society, by providing first-rate undergraduate and graduate education, leading-edge research, and committed public service.”²⁰ Within the Board of Regents organization, the Office of Real Estate and Facilities plays the role of developing and sustaining high quality facilities to support the mission of the USG.²¹ Among the aims specifically identified in the mission statement of the Office of Real Estate and Facilities is a commitment to “support preplanning techniques and sustainable development so that public funds are used wisely.”²² This office also strongly emphasizes the importance of good facilities stewardship in order to best meet the learning and educational goals of the University System.

While the BOR is committed to the principles of sustainability, it as yet has no specific centralized guidance or directives to support the implementation of green building practices in its capital projects, although it is receptive to the idea and does include sustainable design goals as part of its Design Philosophy section in its Pre-planning Guidelines.²³ The structure of the BOR is such that individual campuses have considerable autonomy in their facility-related activities as long as fundamental BOR standards and requirements are met. Accordingly, several campuses within the USG have initiated their own green building activities with the approval and general support of the BOR, and some campuses even have their own guidelines and master plan documents to encourage sustainability in capital projects.

²⁰ <http://www.usg.edu/about/statements.phtml>

²¹ <http://www.usg.edu/ref/about/>

²² *ibid.*

²³ http://www.usg.edu/ref/capital/preplan_guide_2000.pdf

For instance, the Georgia Institute of Technology is home to one of the most visible green buildings in the state: the Technology Square College of Management Building, which received a LEED Silver Certification and was completed in 2003. Georgia Tech also has other examples of green buildings, including the Ford Environmental Sciences and Technology Building, the Lamar Allen Sustainable Education Building, and the Georgia Tech Aquatic Center, that have not formally sought certification under LEED. The Klaus Advanced Computing Building, slated to be completed in April 2006, is anticipated to receive LEED certification and features a variety of green building features such as underground parking and innovative stormwater management.

Georgia Tech has deliberately chosen not to have a formal LEED-driven green building policy but instead weaves sustainability requirements throughout its master plan, procurement policies, and design and construction standards. Georgia Tech recently modified its policy to specifically endorse LEED as a guiding principle, but states that it “feels that in lieu of expending funds for extensive documentation that those funds be used to implement the LEED initiatives.”²⁴ Georgia Tech seeks to have its buildings perform at the LEED Silver level or higher.

Other green building projects within the USG include:

- The \$40 million Paul D. Coverdell Center for Biomedical and Health Sciences at the University of Georgia in Athens, GA, to be completed in Fall 2005 (not seeking LEED certification)
- “Rain garden” biofiltration system at the Chicopee parking lot and Lumpkin Street infrastructure project at the University of Georgia in Athens
- Experimental green roof on the Boyd Graduate Studies Center at the University of Georgia in Athens
- Complex Carbohydrates Research Center at the University of Georgia in Athens (followed LEED principles but did not seek certification)
- Student Learning Center at the University of Georgia in Athens (followed LEED principles but did not seek certification)
- Kennesaw State University’s Social Science Classroom Building in Kennesaw, GA, which is seeking LEED Silver certification and is expected to be completed in Spring 2006.

Since the Board of Regents eventually assumes ownership of facilities developed by public colleges and universities in Georgia, it requires compliance with minimum design standards for all projects. These standards offer an opportunity to insert sustainability considerations into the design process at a single point, but they may also represent a barrier to green building in areas where less-than-green requirements are presently imposed. For instance, some standards for systems such as laboratory ventilation are specified based on air flow requirements and may encourage technologies that are not

²⁴<http://www.facilities.gatech.edu/dc/GTSPECS.pdf>

optimally energy efficient. Reviewing these design standards for green building opportunities would be a good starting point for sustainability that would touch all capital projects undertaken within the USG.

Department of Natural Resources

The Georgia Department of Natural Resources (DNR) is focused on sustaining and enhancing the state's natural, historic, cultural, environmental and economic resources.²⁵ Over the past several years, its activities influencing green building in Georgia have been notable in multiple ways. The Engineering and Construction Section of the Georgia State Parks and Historic Sites within DNR has been the state's most aggressive agency in moving forward with green building. The DNR presently has five LEED Certified buildings to date – more than any other state agency as of the time of this study.²⁶ They are presently ranked third in the nation in terms of numbers of LEED Certified buildings owned, behind PNC Bank and City of Seattle, and all of their buildings are certified at either the Silver or Gold level. DNR is the second-largest building owner in the State of Georgia, behind the Board of Regents.

The total cost of DNR's five LEED buildings is on the order of \$15 million. DNR states that this shows green buildings do not necessarily have to cost more than standard buildings. Two costs they note as being outside their typical project scope are the costs of commissioning, which is not typically done on other projects, and LEED documentation, although together these costs typically are less than 5% of total installed costs of the project. Since its projects are mostly small visitor centers for state park areas, DNR is able to use internal resources and interns from local universities to complete most of its LEED documentation requirements.

DNR has an informal policy that all major new buildings costing at least \$1 million will be certified under the LEED or EarthCraft House programs. Other buildings will be considered on a case-by-case basis to determine the business case for LEED. Their philosophy of funding additional costs for LEED certification is to build those costs into their initial request for state funding, expecting that the cost differential will be on the order of 1-2%.

DNR became a leader in green building due to the initiative of its Chief Engineer, David Freedman. Freedman learned about sustainable design during a stint as an advisor to the National Park Service, a leading federal agency with multiple sustainable showcase projects. Freedman's attitude is, "If DNR isn't going to build green buildings in Georgia, who is?" In his position as chief engineer, Freedman had the unique opportunity to affect change within his agency, and has employed a broad spectrum of sustainable technologies ranging from composting toilets and waterless urinals to recycled plastic lumber, minimal site disturbance, and extensive use of local materials on DNR projects. His efforts have won leadership recognition from the Construction Owner's Association of America. He expects that the Sweetwater Creek Visitor's Center, DNR's latest LEED

²⁵ <http://www.gadnr.org/>

²⁶ The Pennsylvania Department of Environmental Protection presently *occupies* more LEED Certified buildings, including leased space.

project that is to be featured in facility tours with the 2005 International GreenBuild Conference, will be certified at the LEED Platinum level.

Department of Transportation

Created in 1916 as the State Highway Department and transformed into the Department of Transportation (DOT) in 1972, the Georgia DOT is responsible for planning, constructing, maintaining, and improving the state's roads and bridges along with providing planning and financial support for other modes of transportation.²⁷ The DOT supports mass transit, airport, and air safety activities in the state, and also provides administrative support to the State Tollway Authority and the Georgia Rail Passenger Authority. Its mission acknowledges the criticality of transportation as part of a sustainable society:

The Georgia Department of Transportation provides a safe, seamless and sustainable transportation system that supports Georgia's economy and is sensitive to its citizens and environment.

DOT is ready to break ground on its first LEED certified facility, a 67,000 square foot District Administrative Office in Thomaston, GA. Facilities staff elected to pursue a green building on this project due to an expectation of life cycle cost savings, an awareness of environmental concerns, and the need to create a healthy building for their employees. While this will be DOT's first formally LEED certified building, DOT facilities staff did not feel that the process was considerably more difficult or daunting than a typical construction process, although the green building will have more components than a standard prototype DOT office facility as well as nontraditional sitework requirements.

DOT uses a prototype model for all of its vertical construction projects, so lessons learned on this project will be transformed and incorporated into future similar projects – this green building will become the DOT prototype for District Administrative Offices throughout the state. Facilities staff are quite interested in using this first building as a way to evaluate the performance and value of green building. A commissioning consultant has been retained to both commission the building and perform measurement and verification to actively track resource savings in the facility. Initial cost assessment showed an expected 5% premium in construction and 1.4% in design, due primarily to commissioning (which is not presently required on all DOT facilities) and other additional factors such as energy efficiency requirements, additional dumpsters for waste recycling, low VOC products, and others. A three to five year payback is expected to cover these initial investments. Healthy work environment and financial considerations were the primary drivers, and the DOT plans to track impacts on human resources in terms of absenteeism and other factors to measure the impacts on workers after moving to the new building.

²⁷ <http://www.dot.state.ga.us/>

The biggest selling point for green building, from DOT's perspective, is life cycle cost savings. If savings can be demonstrated to other agencies and initial construction costs are not increased too much, DOT believes that the philosophy sells itself. Even on projects that are not seeking LEED, DOT incorporates sustainable design elements because of cost and health issues. Among the sustainability best practices that are now becoming common on DOT projects are on demand hot water systems, daylighting, low maintenance landscaping, and recycled rubber landscaping. Newer projects have used bioswales for stormwater treatment and permeable pavement. Overall, the attitude at DOT seems to be that while sustainable design is definitely different, it's not difficult. Given the prototype design approach favored by this agency, green building is likely to prosper given its life cycle benefits.

Georgia Building Authority

The Georgia Building Authority (GBA) functions as the State Property Manager for approximately 5 million square feet of real estate primarily around the Capitol and also including the Governor's Mansion and several warehouse facilities outside the immediate area. The Facilities Operations Division is responsible for 51 total buildings, and provides custodial, structural, electrical, and preventative maintenance services to these structures, which are actually owned by the State Property Commission. In addition to building-related services, GBA also provides services for cafeterias and catering, landscaping, parking and transportation, recycling, and other property-related resources. Rental income and revenue from services such as catering and parking provide funding to support the activities of the GBA.

Due to GBA's status as an Authority and not an Agency, it has the ability to negotiate longer term leases and agreements with third parties. As such, GBA is the only Georgia entity with experience using Energy Savings Performance Contracting (ESPC), a contractual agreement with private sector contractors that permits those contractors to bear the first cost of energy efficiency renovations and then be paid from realized energy savings over time. GBA has successfully used ESPCs for renovations in and around the Capitol. It also has experience with green roofs – the Capitol Plaza has a green roof/plaza area that has successfully been in service for nearly 30 years.

GBA is receptive to green building in general, as long as it makes sense from a business standpoint. As the landlord for many government headquarter activities in and around Atlanta, it is required to operate like a business and must realize savings from innovation that can offset first costs. One technology GBA has considered in particular is reflective, high albedo roofing to reduce building heat gain during the hot summer months, although this technology is not appropriate for some of the historically significant buildings in GBA's portfolio. With an aging building portfolio and the potential to displace third party leases currently held by some state agencies, GBA is interested in technologies and strategies that can minimize the total costs of ownership while providing excellence and service to its tenants.

Department of Education

The Georgia Department of Education (DoE) envisions leading the nation in improving student achievement. Its mission is to “function as a service-oriented and policy-driven agency that meets the needs of local school systems as they go about the business of preparing all students for college or a career in a safe and drug-free environment where we ensure that no child is left behind.” An important component in fulfilling this mission is the provision of school facilities that enhance teaching and learning. The DoE Facilities Services Unit assists local school districts in developing comprehensive facility plans, acquiring funding to implement capital projects, and reviewing school plans and specifications. Because school districts receive funding through Georgia’s Capital Outlay Program, they could be affected by a green building policy implemented in the state. In recent years, a large percentage of the funding for school construction in several Georgia school districts has been raised through the Special Purpose Local Options Sales Tax (SPLOST) approved by voters. Revenues from this one cent sales tax have provided for the construction of many new schools and much needed renovations in existing facilities. The SPLOST cycle typically mirrors the 5-year comprehensive facilities plan that schools are required to prepare in order to participate in the Capital Outlay Program to acquire state funds for capital projects.

Many school systems in Georgia are already incorporating green design features into their buildings, particularly daylighting and energy efficiency measures, although there are currently no LEED certified public schools in Georgia. One large public high school in the north metro Atlanta area was registered with the USGBC and intended to complete formal certification. The biggest barrier to certification became building commissioning, a prerequisite for LEED certification. Schools in Georgia typically do not conduct commissioning, and the cost at this particular school was reported to be approximately \$100,000. Although there were supporters in the school district, it was determined that commissioning would not be completed and therefore the school was not LEED certified. The school did, however, incorporate many green building strategies.

A second green public school project is presently being designed, the Arabia Mountain school that will be located on approximately 60 acres within the Arabia Mountain Heritage Area. This will be a charter public school with an environmentally focused curriculum. The project will likely seek LEED certification. There may be many other green schools projects planned, but since each school district operates rather independently, it is difficult to ascertain which districts are planning to develop green schools. In the future, the number of LEED certified and otherwise green schools is likely to increase. A fact sheet published by the USGBC in April 2005 noted that K-12 schools account for 6% of all LEED registered and certified projects (by square footage) in the nation.²⁸ In general, however, it does appear as though many facilities personnel within Georgia are very much opposed to any requirements that they obtain LEED certification for their facilities, although they are certainly supportive of efforts to create better performing buildings that better serve their educational missions while reducing resource consumption and environmental impacts.

²⁸ https://www.usgbc.org/FileHandling/show_general_file.asp?DocumentID=871

Department of Technical and Adult Education

The Georgia Department of Technical and Adult Education (DTAE) oversees the state's system of technical colleges, the adult literacy program, and a host of economic and workforce development programs.²⁹ With the third largest building inventory by number of buildings among agencies in the state, DTAE manages the facilities and campuses of 34 technical colleges and 31 branch campuses around the state, providing a large inventory of capital facilities to serve the state's technical education needs.

While DTAE does not have a formal green building policy in place, its philosophy of building is supportive of sustainability principles in general. When DTAE facilities staff interview design firms, they discuss DTAE's general philosophy toward green design and encourage them to apply LEED principles, but DTAE does not require certification, and there are no specific sustainable technologies DTAE encourages for use on its projects. Design firms are expected to find good solutions that are appropriate to meet the needs of the campus on which the facility will be built, while maximizing the scope of project that can be delivered within budget and minimizing total cost of ownership. One sustainable technology recently applied on a classroom building at East Central Technical College in Fitzgerald, Georgia was permeable pavement, used to absorb stormwater runoff back into the soil rather than running off into a detention pond.

For each project, DTAE works with local campuses to develop a program of requirements, helps to manage the design process, and selects the architects. DTAE works closely with GSFIC, who manages the construction process and then turns the building back over to DTAE, who owns it.

DTAE's primary concern with LEED is the cost of registration, certification, and documentation. These costs are typically in the range of 1-2% of total installed cost, which could be several hundred thousand dollars on a project. Justifying this initial investment in what is essentially a third party certificate is difficult, when the alternative is to apply those funds to increase building scope that meets the mission of the educational institution for which the facility is being built. Since funding for operating facilities comes from a different source than construction funding, justifying initial cost increases with the hopes of life cycle cost savings can also be challenging.

A second challenge with respect to LEED is the temptation to indiscriminately pursue points in order to achieve certification, even though the tactics used to achieve those points may not make the best sense for the project at hand. For instance, while installing bicyclist amenities is encouraged under the LEED rating system and is a relatively simple way to earn a point, bicyclist amenities make no sense in very rural campuses to which faculty and students typically commute by car. While DTAE has considered possibly applying for formal LEED certification as part of its projects, it has not yet found sufficient justification for the additional costs this process would impose.

²⁹ <http://www.dtae.org/>

Certain requirements under the LEED system, such as building commissioning and energy modeling, are currently not standard practice for DTAE projects and thus represent significant procedural change as well as increased cost in exchange for returns that are uncertain from DTAE's standpoint. While DTAE is receptive to the benefits and life cycle cost savings likely to result from applying LEED principles, the agency prefers not to become mired in the paperwork. However, DTAE facilities staff acknowledge that a formal certification process is likely the only way to credibly claim that green building standards are being met.

From the standpoint of its mission, DTAE offers a unique opportunity not unlike the Board of Regents and the Department of Education to incorporate green buildings as teaching tools. Part of DTAE's mission is the technical education of tradespeople, builders, and other technical people who will ultimately build the facilities of tomorrow. DTAE's curriculum committee is advised by an industry panel, and curriculum changes are agile and responsive to the recommendations of the panel. As industry in Georgia continues to embrace green principles, DTAE's building-related curricula will likely evolve to produce technical graduates that can meet changing market needs. As such, DTAE is poised to take advantage of green building both as a building owner organization as well as a training organization.

Georgia Agencies that Support Green Building

In addition to agencies with large building portfolios who are seeking to implement green building practices on their own projects, two additional state entities are devoted to promoting green building principles and practices throughout the state in both the public and private sectors.

Georgia Environmental Facilities Authority

One key entity is the Georgia Environmental Facilities Authority (GEFA),³⁰ which functions as the State Energy Office (SEO) and is devoted to promoting clean air, clean water, and reduced energy use in Georgia. GEFA draws upon state, federal, and private funds to provide low-interest loans to local governments for water, wastewater, and solid waste management projects, energy and environmental improvements and technical assistance, and solutions to the state's fuel storage tank problems.³¹ While water and wastewater financing comprise the majority of GEFA activity, the Authority is involved in many other important programs that support the goals of green building, including:

- The Low Income Weatherization Assistance Program, which provides technical assistance and funding for increasing the energy efficiency of low income housing
- The Recycling and Waste Reduction Grant Program, a program providing low interest loans of up to \$1 million for solid waste capital projects, and grants to purchase facilities and equipment for new recycling or waste reduction programs that serve local governments

³⁰ <http://www.gefa.org/>

³¹ http://www.gefa.org/pdfs/2004_Audited_Financial_Report.pdf

- Significant sponsorship for the annual GreenPrints Conference, a green building conference that draws attendees from the southeastern U.S. and beyond
- The EarthCraft House Program, a regional residential green builder program that provides training and certification programs for residential construction.
- City of Atlanta Assistance, including support for a full-time research fellow to develop and implement energy tracking, energy-efficient procurement, energy conservation training for city employees, rate analysis and energy audits for key city buildings, and a green building policy and program for the city.
- Energy and Environment Initiative, a working group of ten state agencies dedicated to supporting and enhancing energy and air quality programs among agencies in the state of Georgia
- Green Building Charrettes for high-profile public and private sector projects in the state, including projects at Atlantic Station, Coca Cola, and Georgia Tech Research Institute.

GEFA is also the sponsor of this project, which has focused on evaluating policy options for promoting green building among state capital construction projects in Georgia.

DNR's Pollution Prevention Assistance Division

A second key entity, the Georgia Pollution Prevention Assistance Division (P2AD),³² exists within the DNR and supports green building efforts throughout the state. P2AD offers on-site assessments, technical and compliance assistance, toolkits, training, and other free resources in the areas of pollution prevention, resource conservation, waste reduction, by-product reuse, and recycling. P2AD also supports environmental partnerships among organizations in Georgia, and annually recognizes environmental excellence in the state via awards other recognition. Recent P2AD-sponsored projects include:

- Sustainable Facilities & Infrastructure Training for public agencies including the Centers for Disease Control and Prevention and state and local governments
- Significant sponsorship for the annual GreenPrints Conference
- A residential construction waste diversion study for homebuilders in the Atlanta area involving local EarthCraft homebuilders
- Support for the Georgia Environmental Partnership, which provides technical assistance, training, and process audit support for small businesses around the state
- Technical assistance to state and local governments on pollution prevention, waste reduction, and resource conservation
- Water Efficiency Services helping governments and businesses with water efficiency audits, assessments and training
- Fact sheets to support implementation of the state's new Fats, Oils & Grease laws

³² <http://www.p2ad.org/>

Together with the state agencies actively working to improve the sustainability of their capital facility portfolios and the extensive growth of green building in the private sector, these agencies represent a capacity to support policies and programs for state-owned buildings in Georgia. The next section summarizes these capacities and perceptions among state building stakeholders pertaining to these potential policies and programs.

Findings: Georgia’s Readiness for Green Building

There is a broad perception across state agencies in general that capital construction funds are scarce, and additional money spent on LEED certification would be more responsibly spent on a larger project scope. However, Georgia facilities stakeholders in general recognize that green building makes good business sense from an operational standpoint, and are willing to consider green building technologies and best practices for their projects. In fact, many agencies already employ green building tactics on their projects just because those tactics represent good design, although they have not historically recognized them as such.

One green building tactic that was mentioned several times as a potential impediment is building commissioning. Historically, commissioning has not been standard practice in state facilities and represents a process innovation with uncertain value to many state facilities decision makers. Some people believe that commissioning represents an extra quality control step that should not be necessary if design and construction firms are doing their jobs. Others cite the dramatic successes of commissioning for owners such as Emory University in proactively identifying and addressing performance detriments in facilities and saving considerable operations and maintenance costs. Commissioning also adds complexity to projects in that its execution requires additional contract language and relationships with additional contractors.

Some agencies felt that LEED is a good mechanism to “get the attention of designers” and provide a common understanding of green building goals and objectives in a market that is still on a learning curve for green building. Others caution against a broad LEED mandate, citing the tendency of design teams to go “point hunting” when faced with a mandatory LEED certification level and utilize technologies that may not be appropriate or sensible for their projects, such as electric vehicle charging stations that never get used.

The importance of having key stakeholders on board was repeatedly emphasized. Among those identified as being critical to the process are agency heads and industry leaders. The need for program support at the agency level was repeatedly emphasized as critical to success. Industry support is also critical, since a few well-placed phone calls to the Governor would be sufficient to stop legislation or executive orders for green building. For instance, certified wood has been a significant impediment to the acceptance of the LEED rating system in Georgia, even though it represents only one out of 69 points available within the system. The forest products industry is one of the strongest lobbies in the state, and there are presently no certified forest products produced in Georgia. Several DNR projects seeking LEED certification have had significant challenges in convincing

local forestry supporters that even though their products do not qualify for the Forest Stewardship Council Certified Wood credit, they can and do qualify for two points under the Local and Regional Materials credit, and in the case of the Suwanee Visitor's Center in Fargo, Georgia, qualified the project for an Innovation Credit for using exceptionally high quantities of local and regional materials as well.

These examples illustrate the need to present substantive evidence of the business case and potential benefits of green building for key Georgia stakeholders in order to gain broad support for a program focused on public buildings. Educational measures, measurement and verification of performance of existing green buildings, and programs to encourage the adoption of low risk, high return green building tactics can help to overcome these potential barriers to such a program in Georgia. One state agency interviewee estimated that state buildings could achieve at least 20% energy savings using low-risk green building technologies, without "doing anything fancy." These kinds of savings, within the context of a total cost of ownership philosophy by leadership in state government, mean that green building makes a good deal of business sense for state buildings and has a good likelihood of success if implemented in a contextually appropriate way.

Georgia's current accounting system does not support analysis of impacts on facility operating costs, nor does it allow savings from efficient building operations to be recouped by agencies achieving the savings. Potential changes are presently being investigated with respect to moving from an object class accounting system to a program/service budget accounting system, which would incentivize savings and efficiencies by allow operation dollars saved to be shifted to other areas. Other legislative barriers include limitations in state contracting ability to one-year contracts.³³

One common barrier that often plagues public agencies does not appear to be a serious impediment in Georgia: including sustainability as an additional cost during initial funding requisition. Interviews with the Georgia Governor's Office of Planning and Budget suggest that incorporating well-justified green building costs as part of pre-project planning and funding requests, when coupled with total cost of ownership analysis substantiating the life cycle benefits of those initial investments, will not present a problem as part of the capital outlay process.

The Commission for a New Georgia's Capital Construction Task Force also anticipated implementation challenges to their recommendations released in 2004, some of which are still relevant barriers to change as reflected in the findings of the current study. These include (Commission for a New Georgia 2004b):

- Agency control of construction process and specific agency knowledge
- History of decentralized management
- Difficulty in changing the funding process

³³ See, for instance, Unannotated Georgia Code 20-2-506 (http://www.legis.state.ga.us/cgi-bin/gl_codes_detail.pl?code=20-2-506) applying to school districts.

- Difficulty in changing statutory requirements
- Fear of privatization
- Continuous constraints on operating budgets.

Additional potential barriers that should be addressed by potential green building programs and policies in Georgia in order to encourage their success include:

- Procurement restrictions that may limit the ability to purchase high performance building components if they are not manufactured locally or by multiple suppliers
- Lobbies or contingents who fear that green building may discourage the use of their products or services, such as small businesses that may not already have green building capabilities or experience in place
- Additional costs of documentation and official certification of projects, or for additional procedures such as commissioning that are not part of current practice but are required to achieve certification
- Perceived lack of value added by formal certification and certain additional requirements like commissioning under limited budgets where the tradeoff is additional project scope.

Many of these issues can be addressed by the compilation and communication of a strong, well-documented business case for green building in the context of total building cost of ownership based on Georgia-specific data. Since many green buildings in the state are still relatively new, the current business case for green is based largely on experiences from other contexts, such as the studies documented in Appendix B. Georgia stakeholders have less confidence in these studies than they would in data derived from their own facilities. Accordingly, formal documentation of the performance of some of Georgia's current green buildings, especially state-owned buildings, is a key opportunity that should be explored to build support and consensus for a green building policy in the state. It also affords an opportunity to reinforce positive innovation in the state by celebrating the successes these facilities represent and the hard work and diligence necessary to make them happen.

CHAPTER 4: PROGRAM OPTIONS, RECOMMENDATIONS, AND NEXT STEPS

The findings of this study document the growing number of other states that are successfully enacting and implementing green building policies around the United States, and suggest that Georgia is ready to begin the process of implementing its own green building program for state-owned buildings. This chapter synthesizes the findings and lessons learned from previous sections of the report into a set of program options, and makes recommendations for next steps that are needed to move towards a green building policy for state-owned buildings in Georgia. It begins with an overview of the elements found to contribute to making a green building program successful, followed by a description of the various options available to comprise a green building program at the policy, program, and evaluation levels. Four possible scenarios are presented and compared as potential options for moving Georgia buildings forward along the path to sustainability. The chapter concludes with a summary of specific next steps that should be taken to move the program forward in the short term.

What does a Green Building Program Need to Succeed?

Predicting the success of a policy within the complex context that is state government is difficult by any standard. Multiple stakeholder perspectives must be considered and aligned behind a common vision and plan of action. Clear rewards that outweigh potential risks must be shown from social, environmental, and economic perspectives to support the business case for changing the status quo. Finally, the implementability of the specific program elements themselves must be carefully considered in designing the programs and policies to ensure their sustainability and effectiveness in the long term, despite the constantly evolving and shifting political nature of government organizations. The following subsections describe each of these considerations in greater detail.

Stakeholders of a Georgia Green Building Program

One of the most important challenges in determining an optimal course of action for a green building program is considering the perspectives and interests of each of the categories of stakeholders who will be affected by such a policy. These stakeholders include, in no particular order:

- Owner agency personnel, including agency heads and facilities staff who will be responsible for interpreting the policy, implementing its requirements, and evaluating the results
- Supporting agency personnel, such as GEFA, GSFIC, OPB, or P2AD staff, who may be responsible for managing funding to implement green building programs to serve multiple other state agencies

- Elected officials, whose endorsement of a green building policy exposes them to the potential political risks and rewards the policy might bring as it is implemented
- Facility occupants, who will benefit from high performing buildings but may suffer if facility scope must be reduced to achieve high performance, or if building technologies do not perform as anticipated
- Taxpayers, who will provide some or all of the funding to support green building programs and who will benefit from increased environmental quality and enhanced productivity of state employees who occupy high performance buildings, as well as a reduced tax burden to cover lower operating expenses
- Industry groups and companies, who provide capital project-related services for state-owned buildings and will be required to comply with policy requirements and deal with associated implications for how they do business
- Lobbies, who represent key taxpaying industries in the state, or non profits, and who are sensitive to the potential influence of policies on their constituencies

Any one of these stakeholder groups has the potential to either offer support or contribute to derailing a green building policy as it is put forth. Owners and supporting agencies in particular will play a strong role in the ongoing success and sustainability of a green building program for state-owned buildings.

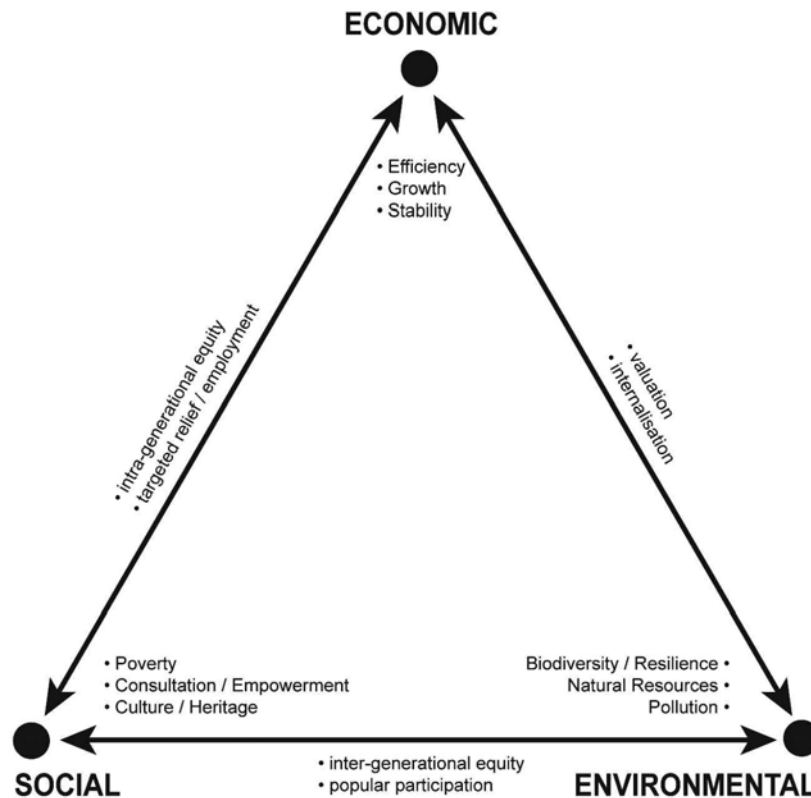
Potential Green Building Program Risks and Rewards

A variety of potential risks and rewards are also associated with green building programs, and must be considered when designing a program configuration. Since the ultimate objective of a green building program is to increase the sustainability of facilities in the state, the three basic elements of sustainability (Social, Environmental, and Economic criteria) provide a balanced basis to evaluate and compare potential program designs (Munasinghe 1993). Figure 4.1 illustrates how these considerations balance each other to work toward a stable human society in which stakeholder needs and aspirations are met in the present while capacity to meet the needs and aspirations of future generations is preserved (after WCED 1987).

Social Considerations

From a social standpoint, multiple factors contribute to the success of a green building program. Since this study is primarily focused on green building programs undertaken by state governments, socio-political factors are considered here from the standpoint of elected officials who will mandate or endorse green building policies, the occupants and facilities staff of buildings subject to the policies, and the taxpayers and tax-paying industries whose interests those agencies serve.

Figure 4.1: Sustainability Considerations (Munasinghe 1993)



From the government standpoint, including both elected officials who make policy and agency stakeholders who implement or experience the direct impacts of policy, social considerations focus on how well these agents are able to meet their obligations to the public toward achieving greater good. Potential rewards of green building programs and policies include:

- Increased effectiveness of facility occupants, potentially resulting in better services provided by those agencies to their constituencies
- Improved image/reputation of environmental leadership both within the state and with respect to other states

From the standpoint of the constituencies whose interests government serves, effective green building programs and policies can indirectly offer, in terms of potential social rewards:

- Support for economic development for Georgia industries and resultant increase in wealth and quality of life
- Increased health and productivity due to improved environmental quality
- Availability of funding to enhance other programs that is no longer needed for facility operations and maintenance

- Better service from more efficient and effective government employees

These potential rewards are likely to result from effective implementation of green building programs, but there are also social risks if programs do not perform as expected, primarily associated with the opportunity costs of funding invested in green building programs and facilities if they do not result in performance improvements. If programs do not perform well, government agencies are accountable to taxpayers for how funds have been spent. With programs that are new or not well understood, the perceived political risk associated with endorsing them may outweigh the promise of benefits.

Environmental Considerations

The second category of considerations centers around the natural environment and the impacts on ecological systems and resource bases that can be mitigated and/or improved by implementing green building programs. Potential rewards include:

- Reduction in likely levels of resource consumption, e.g., water, energy, materials
- Reduction in likely levels of waste, destruction, and pollution that lead to ecosystem degradation and biodiversity loss, e.g., solid waste, wastewater/water pollution, air pollution, and site disturbance
- Increase in sustainable site development practices and improvements in transportation efficiency.

For the purposes of this project, alternatives can be compared environmentally in terms of likely numbers of buildings affected by each proposed scenario over time and the scale of change in those buildings. Future research should examine candidate program alternatives in greater detail to characterize and compare likely ecological impacts of different program components.

As with social rewards, potential environmental rewards must also be weighed against potential risks if programs do not behave as expected. Environmental risks include considerations such as unproven or unfamiliar construction materials and technologies that fail in operation and must be replaced, requiring additional resources to address the problem. While the potential for innovative technologies and practices to “backfire” is inherent in all innovation, it is especially ironic in the case of environmental technologies, where replacement potentially entails more waste and resource consumption than installing a traditional alternative in the first place.

Economic Considerations

The third category of evaluation criteria focuses on economics, including direct costs and benefits associated with green building policies and programs, and indirect costs and benefits that occur as a result of better-performing capital construction processes, the facilities that result from them, and the impacts of those facilities on their occupants. The most obvious economic cost impacts of green building programs and policies are the direct costs of implementation. Categories of program implementation costs include:

- Program administration costs
- Cost of project registration/documentation/certification
- Increased first cost of projects due to improved systems, additional design and construction requirements, building commissioning, etc.
- Increased life cycle costs of projects for maintenance of unfamiliar systems, etc.
- Program marketing costs
- Training costs
- Technical assistance costs
- Evaluation/compliance costs

These costs are coupled with the risk of remediation costs if unknown green building technologies do not perform as expected. Potential quantifiable areas of savings resulting from effective green building program implementation include:

- Savings in operating and maintenance costs, e.g., energy costs, system replacement, water/wastewater treatment, waste disposal
- Savings in first cost due to system optimization, design “right-sizing,” reduced waste generation, recycling revenues, etc.
- Reduced liability, e.g., for human health risks
- Reduced environmental management/compliance costs
- Improved productivity and employee retention

Many indirect economic benefits can also stem from green building programs, including value of resources saved for future use, value of environmental image, and value of environmental quality due to avoided negative impacts, although these kinds of costs are not typically included directly in decision making since they are difficult to quantify and attribute to specific project decisions. Nevertheless, all of these factors should be considered at least conceptually in terms of evaluating the costs and benefits of green building programs and designing policies that optimize benefits for stakeholders.

Together, social, environmental, and economic impacts of a program provide a balanced measure of the ultimate performance of the program in terms of its influence on sustainability of facilities in Georgia. These three categories of impacts serve as the fundamental basis for evaluating program designs in this chapter along with program implementability, which is discussed next.

Implementability Considerations

In addition to the likely social, environmental, and economic impacts that may result from a green building program, the design of the program itself contributes to its potential to succeed within its organizational and political context. From an organizational standpoint, implementability considerations center around compatibility of

potential programs with the standard operating procedures, constraints, and conventions of implementing organizations. Specific considerations for implementability include:

- Compatibility with statutory requirements and funding processes
- Availability of a trigger to establish urgency of need for the program, e.g., an energy crisis
- Degree of change required of individuals within agency who are affected by the program
- Level of additional burden imposed by the program on implementing agents
- Existence of enthusiastic change agents and support networks with appropriate stature and resources within the organization
- Existence and observability of rewards or benefits for program achievement
- Absence or ability to mitigate potential risks associated with program implementation
- Likelihood of strong political endorsement or, conversely, significant political opposition to the program by lobbies or other constituencies

These factors, described in more detail in the diffusion of innovation literature (e.g., Rogers 2004), influence the degree and rapidity with which individuals and organizations adopt new or unfamiliar technologies and practices that have the potential to improve their existence. Together with the potential risks and rewards each program option offers, implementability considerations can help predict which program designs will “take hold” and be successful in achieving their full potential while avoiding risk of failure.

The next section of this chapter identifies candidate options that can be considered as elements of a green building program for the state, and evaluates those elements in terms of the criteria of social impacts, environmental impacts, economic impacts, and implementability. These then form a basis for constructing potential policy approaches for Georgia that can serve as paths for action by the state toward green building.

Green Building Program Options

In defining the elements that could be incorporated as part of an overall green building program for the State of Georgia, three basic categories of options emerge: Policy options, whereby formal guidance is put in place to require or encourage green building activities; Program options, which may provide funding, information, or other needed resources to make green building easier to achieve; and Evaluation options, which serve to measure the outcomes of the program and evaluate its success. The next three subsections describe potential options within each of these three categories, along with their pros and cons in terms of the evaluation criteria identified in the previous section.

Policy Options

Policies can come in the form of an executive order signed by the governor, a bill passed by the legislature, or even an internal agency directive issued by the executive staff. The following options could be made in any of these forms:

- Meet LEED or equivalent – A policy can mandate compliance with a specific set of green building guidelines. The simplest method would be to require that buildings meet the USGBC’s LEED standard, but certainly a different set of guidelines could be used. Varying degrees of rigor ranging from requiring buildings to simply meet the standard and requiring that buildings be put through the certification process. Within this policy option it is also possible to vary the scope of the mandate in the following ways: 1) by limiting the policy to specific building types, such as offices; 2) by limiting it to buildings of a certain scale, such as over \$1 million or greater than 25,000 ft²; 3) by applying it to a subset of agencies; or 4) by only requiring each agency to do one pilot project under the policy.
- Endorse & Encourage LEED or Equivalent – Another approach might be to issue a policy which does not mandate any specific action but that officially endorses green building as a priority for state facilities and encourages agencies to voluntarily adopt green building practices.
- Create programs to encourage green building activity – In addition to being used to show support for green buildings policies can also be used to create programmatic elements that provide inspiration and support for implementation of green building practices by agencies. While these programs can be created outside of official policy documents in some cases a policy, such as an executive order, gives politicians an opportunity to officially put their support and endorsement behind a program; this can be beneficial to the politician and can encourage agencies to take advantage of the programs because they know it has support from the top. This can be done in conjunction with requirement to meet green building standard.
- Create a council or task an agency to develop standards or plans – In a situation where there is support for green buildings but not a consensus about what standards to use and/or how far reaching and firm a policy needs to be, it might be best to use a policy to establish a working group to take up the issue. This is a very useful first step and gives a clear signal of the governor’s support for the issue. By creating a working group in the form of a council or task force this gives the governor the opportunity to have input from critical stakeholders in a fair and open process. This approach also avoids some of the political risks inherent in mandating a specific set of guidelines on a resistant agency population.

Table 4.1: Green Building Policy Options – Pros and Cons

	Require LEED or Equivalent	Encourage LEED or Equivalent	Encourage Green Building in General	Create Council or Task Force to Set Standards
Social	Increased jobs if done externally; people may be healthier and happier in their workplaces; increased productivity is possible.	Same as LEED required, but with likely fewer people doing it and subsequent reduced costs and benefits.	Benefits and costs are program-specific.	Long-term impacts may result from eventual greater uptake of subsequent policies; increased network can provide inspiration for independent action and opportunity to share lessons and experiences.
Environmental	Reduced environmental impact and demands on infrastructure.	Reduced environmental impacts and demands on infrastructure, although less than mandate due to lower uptake.	Benefits and costs are program-specific.	Long-term impacts may result from eventual greater uptake of subsequent policies.
Economic	Increased costs due to certification fees and commissioning, but expected life cycle operational savings.	Lower cost of implementation due to lower uptake; potentially lower life cycle cost savings as well.	Could be costly to implement; depends on the nature of the programs specified. Benefits are also program-dependent.	May be direct implementation costs for meeting support and documentation.
Implementability	Greater personal load for implementors if done in house; some people oppose LEED for various reasons; telling people what they have to do.	Potentially lower uptake, but those who do uptake do it cheerfully and do a better job (less point-mongering). Can be used as a springboard for a future requirement while building support. Gives formal political endorsement to people inside agencies who already aspire to do green building.	Gives formal political endorsement to people inside agencies who already aspire to do green building, and gives specific direction on how to proceed. Does not offend people by imposing requirements without support. Provides tools and resources to support the end goals.	Works well to achieve broad consensus and buy-in as long as all key parties are represented. Adds additional burdens to volunteer participant workloads. Requires strong leadership and effective facilitation. Recommendations from the council may carry more weight than simple political mandates. Gives alternative systems the chance to present themselves to the council and be carefully evaluated.

	Require LEED or Equivalent	Encourage LEED or Equivalent	Encourage Green Building in General	Create Council or Task Force to Set Standards
Other Comments	Provides temptation to do things that may not be cost effective or appropriate just to get points.	Same as LEED mandate, but with likely fewer people complying and subsequent reduced costs and benefits. Lower likelihood that people will not do things just for the sake of points.	This component can increase the likelihood of success of other policies that encourage or require standards like LEED.	Good in situations where broad consensus does not already exist; avoids political risks associated with mandating specific guidelines and allows a mechanism for figuring out the most appropriate way to get things done.

Program Options

A variety of program options have been developed by other agencies or organizations for increasing the uptake of green building techniques and practices. Programs can be established through formal policies or can be created on an ad-hoc basis. Many programs already exist within Georgia or in the United States and with a coordinated effort can be leveraged into a significant green building program that is offered to state agencies. Critical to the success of all programs is a source of funding and support to build, promote and continue the efforts undertaken by those programs. Program options include:

- **Technical Support** – Technical support can be useful for creating green building capacity and overcoming ignorance about new and innovative green building techniques which may run counter to the ways things have typically been done. Technical assistance can be provided directly by the agency designated to promote green building among state buildings or indirectly by providing funding for technical assistance by other external providers.
- **Training** - Unlike technical support that provides assistance for specific projects, training opportunities can be used to inform facility stakeholders on topics ranging from general sustainability, green building principles, LEED requirements, to technical details of heat recovery wheels. The state may not need to create any additional training modules but may find ways to increase the number of state personnel attending the myriad sustainable building training options throughout the state such as subsidizing the cost of training, or merely encouraging attendance at training seminars.
- **Guidance Documents** – Changing practices can be intimidating and overwhelming for people accustomed to doing things another way and while there are many tools out there for helping people learn about green building the amount of information can be overwhelming. Add to that the fact that much of the information out there is not valid for all circumstances. Many states have found that it is useful to create a guidance document that distills all the green building advice down to include only that information which is most relevant to their climate. This document can be a tailored version of LEED that highlights the strategies that have been most successful for projects in the climate.
- **Demonstration Projects** – Sometimes what is necessary is to show people that it can be done. A successful green building project can go a long way to dispel the fears of green building opponents. A demonstration project can be done at a much lower political cost than getting a policy put into place and if successful it can be a supporting point in establishing a policy later on.
- **Incentives/Subsidies** – Rather than mandating that agencies adopt green building practices, another approach is to reward agencies that are ahead of the curve and provide motivation for other agencies to follow their lead. Incentives that we have seen in other states include reimbursing the cost of LEED certification, governor’s awards for most sustainable new building, and positive press coverage.

- Modified Institutional Practices – Often procedural barriers make achieving green building difficult, and programs to modify institutional constraints can help to facilitate green building actions. Examples include contract vehicles for commissioning or ESCOs, waiving one-year contract limit requirements, prequalification of contractors or products, etc.

Table 4.2: Green Building Program Options – Pros and Cons

	Technical support	Training	Guidance documents/tools	Demonstration projects	Incentives/subsidies	Modified institutional practices
Social	May increase confidence to try innovative things on projects; adds capabilities to teams that don't already have them; can make green building seem like something that requires expert assistance and disempower individuals.	May increase confidence to try innovative things on projects; may provide networking opportunity and interaction with peers; may build greater internal capacity and support since it empowers individuals who receive training.	May increase confidence to try innovative things on projects. Individually empowering, but essentially an individual effort; no specific opportunities for networking.	Occupant benefits from green design on demonstration facility occupants. Long-term impacts may result from eventual greater uptake of green building best practices that are effectively demonstrated on these projects.	Impacts may result from greater uptake of green building best practices.	Impacts may result from greater uptake of green building best practices.
Environmental	Impacts may result from eventual greater uptake of green building best practices.	Impacts may result from eventual greater uptake of green building best practices.	Impacts may result from eventual greater uptake of green building best practices. Depending on the nature of the document, can help to tailor efforts to those most effective for the specific context, e.g., what works best in Georgia.	Environmental benefits from green design on demonstration facility. Long-term impacts may result from eventual greater uptake of green building best practices that are effectively demonstrated on these projects.	Impacts may result from greater uptake of green building best practices.	Impacts may result from greater uptake of green building best practices.

	Technical support	Training	Guidance documents/tools	Demonstration projects	Incentives/subsidies	Modified institutional practices
Economic	Have to pay for implementation, but ultimately will speed learning curve and build broadly applicable capacity that can result in long-term savings.	Have to pay for implementation, but ultimately will speed learning curve and build broadly applicable capacity that can result in long-term savings.	Less expensive because it's generated once but used many times. Relatively minimal ongoing costs for updating, and dynamic options that are self-updating are possible.	Could capitalize on existing green buildings by designating them as demonstration projects and promoting them. Access to different funding sources and donations is often possible. Funding commitment building by building, not an ongoing commitment.	Direct first cost of implementation varies by program type, e.g., paying for LEED certification or commissioning. Should be phased out over time.	No cost outside normal operating costs for government agencies, unless feasibility studies or similar are required.
Implementability	Providing tech assist does not ensure uptake, but at least it applies to an immediate real project situation. Potential for capture and transfer of lessons learned via centralized tech support provider. Depending on who provides the tech support, can generate or suppress market capacity.	Providing training does not ensure uptake. The next relevant project may not happen soon.	Requires individual adaptation to specific cases. May have to provide dissemination and training to ensure widespread effective use. Can be tailored to meet the culture, constraints, and needs of the organizational context, and therefore be more easily adopted. Does not ensure uptake.	Lower risk of perceived failure on these projects (since they are designated as pilots/demonstrations) encourages greater innovation. Improves the implementability of future projects due to ability to learn from these special cases.	Greatly reduces the most significant barrier to implementation: perceived increased first cost.	One effort can be used multiple times by multiple agencies and projects. Examples include contract vehicles for commissioning or ESCOs, waiving one-year contract limit requirements, prequalification of contractors or products, etc.

Evaluation Options

Evaluation can cover both program compliance and/or the effectiveness of the policy at the individual building level and overall. Sometimes but not always, policies explicitly specify how compliance should be measured or demonstrated, and specify reporting and accountability requirements that program implementers must follow to document compliance. These measures also provide data for overseeing agencies to use as a basis to evaluate the effectiveness of the program as a whole. It is also possible to undertake some voluntary program evaluation in the absence of a policy. Options include:

- Third Party Certification, LEED or equivalent – This method is effective for insuring that specific buildings follow the proscribed green building guidelines. It is a good mechanism for creating a clear metric with little administrative burden on the state government for ensuring compliance, but it does put a lot of responsibility on the agencies managing the construction process. Certification through the USGBC also carries a price tag that some organizations have found to be a barrier and they have preferred to put that money directly into the building. It would be possible for the state to develop some other form of third party validation though this would not be free or easy. It was suggested during some of the interviews that states would be open to having a third party certify their buildings but did not care whether or not it was the USGBC.
- Regular reporting requirement – This requirement can be combined with third party certification. States have set periodic reporting requirements for agencies to report back to a center agency or to committee or council a report on their green building accomplishments and whether or not they followed any policies that have been established. It is possible that by adding a reporting requirement that creates a greater sense of accountability which ultimately results in greater action.
- Performance monitoring & reporting – If the goal is to achieve better performing buildings that consume fewer resources the best approach is to require that agencies monitor their buildings and regularly report this data to central authority. A requirement that agencies address and develop an action plan for how they will remedy any performance deficiencies would be even more powerful.
- Post Occupancy Evaluation - In addition to rating systems that help to guide design and operationalize “green” during a project, evaluation of post-occupancy performance is a useful tool to ensure that buildings are indeed meeting their design intent and thereby making progress toward the underlying or driving goals of the green building policy such as energy savings. While none of the policies studied explicitly address post-occupancy evaluation (POE), some agencies are informally conducting or planning to conduct such evaluations of their green projects. Post-occupancy evaluations may range from a simple walk-through to intense investigative studies using a variety of research methods to correlate physical factors with occupant-related outcomes. Post-occupancy evaluation can include:
 - Utility studies, including power and water consumption

- Employee productivity studies
- Absenteeism studies
- Indoor air quality testing
- Occupant satisfaction evaluations
- Acoustical studies

Whatever the mechanism or mechanisms for evaluation, measuring the impacts of green building policies and programs is essential to remain accountable to taxpayers who ultimately support those programs and benefit from their existence. Program efforts supporting policies coupled with specific evaluation mechanisms can be combined to define scenarios for increasing green building practices in state-owned facilities. The next section of this chapter describes four possible scenarios to be considered for implementation in the state of Georgia.

Table 4.3: Green Building Evaluation Options – Pros and Cons

	Third party certification	Regular reporting requirements	Performance monitoring and reporting	Post-occupancy Evaluation
Social	Pride in certification outcomes; external validation; visible reward for achievement.	Introduces accountability. Can also introduce a spirit of competitiveness and motivation to excel. Visible and public acknowledgement of achievements.	Introduces accountability. Opportunity for feedback and action may empower facility manager to proactively deal with problems, resulting in greater occupant satisfaction and productivity.	Most likely option to give good information on true social impacts that can be applied as lessons to future projects. Can be empowering to occupants.
Environmental	Ensures that basic standards are met, but doesn't necessarily guarantee environmentally beneficial outcomes during operation	Can build on third party certification and encourage positive environmental outcomes.	Encourage actually meeting environmental performance goals during operation rather than just meeting standards up front.	Encourage actually meeting environmental performance goals during operation rather than just meeting standards up front.
Economic	First cost of implementation can be considerable; risk that certification is not achieved.	Can be minimal cost to implement and imposed on existing personnel.	Ongoing program costs can be considerable, but afford the opportunity for operational adjustments that can result in savings.	Ongoing program costs can be considerable, but afford the opportunity for operational adjustments that can result in savings. Likely to employ a third party to perform.

	Third party certification	Regular reporting requirements	Performance monitoring and reporting	Post-occupancy Evaluation
Implementability	Generally a one-time event per building. Considerable opposition at present to the level of effort and cost required. Many stakeholders have to provide data to meet third party certification requirements, making documentation complex and difficult. Risk that certification is not achieved.	May require a centralized person to continually pester agencies for data. Can be piggy-backed on other data submittal requirements such as annual performance or status reporting.	Requires initial investment in monitoring equipment or possible employment of a third party. Also requires ongoing data analysis and interpretation. Agency maintains control and can take immediate action to remedy defects as they are discovered. Proactive.	Fear of identifying problems that are otherwise not obvious and could be embarrassing or reflect poorly on the project team or building. Perception of less control than with performance monitoring. Likely to be a one-time event, not ongoing.

Green Building Program Scenarios

There are a number of different paths that the state of Georgia could take in the pursuit of greening our state facilities. This subsection lays out four distinct paths along with the possible benefits and risks each entails: (1) Maintaining Momentum; (2) Working with the Willing; (3) Coalitions and Consensus; and (4) Legislating LEED. These scenarios build upon the policy, program, and evaluation options that were put forth in the previous section of the chapter to create a continuum of action levels for green building that could be undertaken by the state. The following subsections describe each scenario in greater detail.

Scenario 1: Maintain Momentum

One possibility is to take no new action and to allow current green building activities in the public and private sectors to continue as they would have. As was revealed during the interviews with different state agencies and documented in Chapter 3 of this report, considerable interest in green building already exists in Georgia. Some of the largest property-owning state agencies have already begun to take action voluntarily. Even in the absence of a policy or additional programs, the state building portfolio will continue to become more efficient in terms of resources and perform better over time due to these existing efforts. The number of LEED certified buildings and support for green building in the state will also continue to grow even in the absence of additional formal programs or policy actions. There was no evidence of any real resistance to green buildings among Georgia agencies, so it is not likely that support for incorporating green building into state facilities will diminish or fade over time.

Pros: This scenario has the benefit of requiring no additional funding or action to implement and therefore is a very low cost and easy approach to green building for the state. It also does not require any political capital; no high level officials need to support it in order for it to continue.

Cons: Without ramping up existing programs or policies, Georgia will likely fall behind other states as they make progress in greening their facilities. The state will also miss out on many of the benefits of having a greener building portfolio and as a result have suboptimal buildings with higher operations and maintenance costs than necessary. Inaction could have negative consequences for industry in the state as well, since green buildings represent a fast growing, profitable market, and state programs and policies can play a valuable role in building private sector capacity for goods and services to support green building.

Scenario 2: Working with the Willing

A slightly more aggressive approach would be to celebrate and reward current green building activities within the state and reach out to the agencies and agency staff that are already receptive to green buildings, providing them with the tools they need to be successful. Some agencies are already making progress on their facilities, most notably DNR, and other Georgia agencies have expressed interest in or are actively

experimenting with green building practices on their projects. When asked what it would take to get them to test green building strategies that they had not tried before, several Georgia agency representatives seemed very receptive and stated that they would not really need much incentive. Much can be done by working with these groups of people to reward early adopters and encourage those who are willing to try it out to become adopters themselves. This encouragement can come in the form of a policy that gives support and endorsement for the activities of the willing, and through programs that provide tools, such as guidelines, or incentives to act, such as funding to cover certification costs or commissioning. It is also possible to pursue this path with no formal policy but solely with the determination of organizations that presently provide technical support to reach out to state facility planners. It would not even be necessary to create new programs – the desired ends can be achieved to some degree by extending the reach of existing programs to state agencies.

Pros: This approach allows people to come to green building techniques on their own timeline and of their own volition. Therefore, they are more likely to buy in and embrace the strategies as their own after trying them, resulting in greener state buildings without facing opposition to legislation. This approach also may result in selection of green building technologies based on likelihood of success and appropriateness criteria, rather than based a goal of maximizing points within a rating system. By making existing programs available to state agencies, this approach would build support and a larger network of green building advocates paving the way for stronger legislation in the future.

Cons: Taking this approach might leave some green building advocates impatient for action, since change would occur more slowly than it would with a legislative mandate requiring adherence to green building guidelines. It is possible, but not likely, given the current climate in Georgia and level of interest among agencies, that there would be few people taking advantage of the programs.

Scenario 3: Coalitions and Consensus

A still more active approach taken by many other states is to establish a council or working group to develop an overall vision and plan of action for increasing green building at the state level. Councils tend to be most effective when they are created by the governor, but they can also be successfully implemented as a grass roots initiative. Critical to the success of this approach is bringing the right people onto the council and making sure that all stakeholders are represented. The Commission for a New Georgia and the Georgia Land Conservation Council provide excellent precedents to demonstrate that this approach can be successful in Georgia. The industry-based coalition of architects (AIA), engineers (AECE), and contractors (AGC) that developed and supported 2004's unsuccessful policy attempt for demonstration project requirements in state agencies also serves as proof of strong industry interest in and endorsement of green building in the state. The ultimate aim of this approach is to rally strong support and alignment across multiple constituencies, thereby increasing political momentum while creating discrete recommendations that have broad buy-in. The outcome of such efforts often provides a foundation for subsequent policy, often in the form of an executive order, which requires implementation of the recommendations of the council.

Pros: This strategy builds broad support among all stakeholders represented in the coalition or council, and creates buy-in for recommendations since they were developed by representatives of all constituencies. The process affords taking everyone's concerns into account. Similar strategies have already been used effectively to achieve change in capital project processes in Georgia, so precedent exists as well as the institutional capacity and knowledge resulting from prior efforts. Substantial industry alignment and interest has already been established to promote prior policy efforts, and could be tapped to provide representation on a council.

Cons: Without effective facilitation and directives, this process can drag on unnecessarily and may not result in clear consensus or discrete, actionable recommendations. Recommendations of the council, while likely to represent consensus, may not represent the most expeditious approach to greening Georgia buildings and may be biased in favor of the interests of the strongest constituents. Not all considerations may be taken into account, particularly when their economic impacts are not directly felt. If the process is not inclusive, it could breed animosity among un- or under-represented stakeholder groups.

Scenario 4: Legislating LEED

A fourth scenario, Legislating LEED, falls at the most aggressive end of the spectrum in that it represents a strong mandate that has survived the legislative process and requires documented compliance with an external standard. Of course, variations on this scenario exist, including mandating LEED compliance via executive order instead of legislation, incorporating reasonable exclusions to focus LEED efforts on buildings where it is most likely to be beneficial, and others. However, this scenario represents the most aggressive action on the spectrum of possible actions for Georgia at this time, since it will require explicitly addressing questions such as which standard, what buildings, how to measure, who pays, and who is responsible in such a way that all stakeholders buy in and do not derail the process before the policy is in place.

Pros: Legislating LEED is still quite innovative from the standpoint of states in general. Such a policy would provide bragging rights and set Georgia apart as a state that takes green building seriously. If successful, this kind of policy would result in many LEED certified buildings for the state. Referencing an industry standard such as LEED provides a common understanding of requirements among stakeholders and a concrete way to measure achievement.

Cons: This approach would require considerable political capital to achieve, given the current level of acceptance of LEED among state agencies and lack of a clear and strong advocate for green building among elected officials. There may be disagreement about who will pay for requirements such as project registration and certification, since additional resources are required to support these activities. This could encourage facility owners to make suboptimal decisions to achieve compliance, rather than striving for the best building in each circumstance even if it does not meet the stated goal. If this is achieved via an executive order, there is risk of poor implementation and abandonment

when government leadership changes. The present governor may not be willing to support such a policy – lobbies may complain too loudly, or the business case may not yet be strong enough to appeal to decision makers. Failed policy attempts may instigate fierce opposition, making it more difficult for future policy attempts in this area and delaying overall progress toward green building as a result.

Recommendations

Given the current state of green building in Georgia and the level of knowledge, acceptance, and adoption among state stakeholders, this study suggests that while *Legislating LEED* could be the desired end state of a policy process, several steps must be taken and assets put in place before such a policy could be successful in this state. On the other end of the spectrum, *Maintaining Momentum* represents essentially a “do nothing” alternative, and is likely to do nothing to derail the trend toward green building even with no actions or resources expended on the part of state government.

In the middle of these two extremes are the *Working with the Willing* and *Coalitions and Consensus* options, which could be undertaken as interim steps toward an eventual goal of LEED legislation with comparatively little friction. *Working with the Willing* could be implemented with as little as a commitment on the part of existing state green building support programs (e.g., GEFA and P2AD) to apply their existing programs to state-owned buildings, or as much as a broad array of new, well-funded programs dedicated specifically to supporting state facilities. Likewise, *Coalitions and Consensus* could range from a self-started grassroots initiative among state facilities managers to a formally established task force appointed by the governor to tackle the problem.

Any combination of *Working with the Willing* and *Coalitions and Consensus* options would likely be effective in increasing the level of green building activity undertaken for state-owned buildings within the present organizational and political context. Specific program designs should take into consideration available funding and institutional support along with the evaluation criteria for options described in previous sections. The optimal configuration of these elements requires knowledge of both the current specific needs and information gaps of state owner agencies versus the available programmatic resources presently in place that could be leveraged to meet these needs. A gap analysis would reveal options for programmatic investment that could better meet agency needs without duplication or redundancy.

Next Steps

While all the actions described in the scenarios hold the potential to move state agencies toward greater adoption of green building technologies and practices, it is important to remember that the ultimate goal is greater sustainability among state-owned facilities in Georgia, and that adoption of green building technologies does not necessarily equate to more sustainable buildings over time. The most expeditious path to that end is likely to continue to evolve as political and environmental contexts change. Any set of actions taken to promote green building must take into account these contexts or risk not only its own failure but also risk hindering future green building efforts as well.

To better define the context in which green building programs and policies will be implemented in Georgia and provide tools to fill known program gaps, several immediate next steps are recommended as short term actions that can piggyback on current activities to address specific gaps identified by Georgia agencies. The following subsections describe each of these next steps in greater detail.

Inventory/gap analysis of GA resources and agency needs to develop investment and funding recommendations

The first recommended next step is to conduct a comprehensive inventory of state agency needs related to green building implementation and, in parallel, an inventory of resources available to those agencies to support green building goals. While this study provided a survey of current perceptions and barriers to green building among Georgia agencies, a detailed inventory of all existing capital project guidelines and similar documentation was outside the scope of the study. Future studies should begin by inventorying existing guidelines and documents to identify strategic entry points for sustainability, and developing green building tools, language, guidelines, and other resources to support green building within the context of existing organizational practices and procedures. In short, there is a need to map and prioritize opportunities for green building programmatic support within current agency operating procedures.

Concurrently, a regularly-updated inventory of local, regional, and national resources in green building is needed to determine what assets are presently available to Georgia agencies and their degree of utilization by state entities. Many of these resources may be unknown to agency stakeholders and therefore be subsequently untapped by them. Such an inventory could be the basis for an educational program or online resource guide that specifically targets the needs of state decision makers. A gap analysis would reveal areas in which additional programmatic investment is needed to support agency actions, and additional funding could be pursued from both traditional sources such as the U.S. Department of Energy and nontraditional sources such as private foundations to support these investments.

The two previously described elements could be used a basis for beginning a dialogue with potential state agency users of tools. The purpose of this dialogue would be to determine the kinds of support that agency staff feel they need to begin greening their building projects and start mapping the existing resources to those needs. Most likely there will be some needs that can be met with existing programs and others that can be met with an enhancement to existing programs. Presumably there will also be areas of need that cannot be met with current programs and for which new tools will need to be developed in a way that is most useful to the targeted end users. The benefits of this initiative would be the effective use of existing resources and the ability to make strategic decisions about what new programs will be most critical to advancing green building in the state.

Voluntary Sustainable Design Guidelines for the State Construction Manual based on what works in Georgia

One immediate gap identified by multiple stakeholders is the lack of specific sustainable design guidelines for state facilities that are appropriate for Georgia. As Georgia revises its State Construction Manual, it faces a unique opportunity to incorporate sustainability principles and best practices into a guiding document that will touch nearly every agency and every state building to be constructed for the next several years. Presently, sustainability considerations are included implicitly in the manual in some ways, but no structured guidelines are provided for state agencies and the organizations that design and construct their built facilities to systematically consider sustainability for every project facet using technologies and practices appropriate for Georgia. Stakeholders involved in capital projects for the State of Georgia need sustainability guidelines for their projects that point them to *proven* best practices and technologies that will be most effective in increasing the sustainability of those projects at minimal total cost of ownership.

This recommended next step would develop a set of voluntary sustainability guidelines customized for State of Georgia capital projects that can be used during the planning, design, and construction of public projects. Specifically, it would focus on inventorying green building technologies and best practices that have been successfully employed on both public and private buildings in the State of Georgia and surrounding states. Case studies of facilities that have received certification under the LEED Green Building Rating System could be developed to highlight what works and what does not for green buildings in the State of Georgia, and these lessons learned could then be articulated as starting points for building green in future facilities. The outcome of such an effort could be a stand-alone module within the State Construction Manual that guides stakeholders of future projects toward choosing the most effective sustainability tactics for their projects.

The broader impacts of such a project would stem from providing clear guidance to state project stakeholders on what sustainability tactics are most effective in the context of Georgia capital projects. Project decision makers would be more confident in trying innovative sustainable technologies when they have clear evidence of how those technologies have performed for their peers, and they could quickly focus on tactics most likely to perform effectively for their projects while not wasting time or resources on ineffective strategies. The overall outcome for Georgia taxpayers would be better state buildings that work well for their occupants, save energy and resources, and achieve the goal of greener building with low risk, proven technologies.

Building the Business Case for Green: Building Performance Data Collection as Part of Agency Annual Facility Reporting

While many facility decision makers in state agencies believe green building makes good business sense, there is still a gap between this general belief and the level of confidence required to take action to incorporate green building innovations in future projects. All green building activity within state government is presently voluntary, not mandated, and achieving additional buy-in requires solid evidence that reduces risk of innovation for

decision makers. A strong business case would also be required to motivate legislative or executive action for more formal green building mandates or endorsement.

From whence should such evidence come? A variety of studies in other parts of the United States have begun to comprise a body of evidence to support the business case for green building, as documented in Appendix B, but much of it remains anecdotal and incommensurable, and none of it applies specifically to Georgia. Green building is still comparatively new in Georgia, and most green buildings that have been built are not systematically monitored to verify their performance in operation. A mechanism is needed to capture consistent performance information along with initial design and construction parameters to firmly establish a basis for the business case for green building in Georgia.

Through GSFIC, Georgia is preparing to launch a new effort for developing a computerized facility portfolio management tool that will support state facility decision making from a whole portfolio standpoint. Agencies will be required to provide building information updates on a regular basis to the tool about facility age and condition, available space, energy use, and other key parameters. With careful thought, sustainability-related data collection could be piggybacked on this effort to provide an unprecedented level of consistent, regular data about real building performance over the life cycle correlated with initial green building design and construction tactics, resulting in a quantitative evaluation of what tactics really make most sense for state buildings.

To reach this point, sustainability-related variables must be identified and prioritized, and potential approaches to cost-effectively mining values for those variables or directly collecting information on them must be evaluated. The outcome of this effort would be a set of performance parameters for state buildings that provide the capability to distinguish between green and traditional buildings and correlate with specific building practices, attributes, and tactics. The benefits of this initiative would derive from systematic knowledge of what works well in Georgia, along with enhanced confidence in (and hopefully greater adoption of) green building practices for state-owned buildings.

Working Group to identify Vision and Plan of Action

If green building practices are to flourish among state-owned facilities in Georgia, key stakeholders involved in planning, designing, constructing, operating, maintaining, and decommissioning those facilities must agree on a vision for what is desirable, and a coordinated and aligned plan of action to achieve that vision. As discussed in the Recommendations section of this chapter, the Coalitions and Consensus path for green building offers good potential for generating broad support and buy-in by represented stakeholders and can provide a platform for developing both the vision and action plan. The most basic structure of a coalition to support green building for state-owned facilities would be a voluntary council of interested parties who agree to establish a nexus of green building support for the state. The council could include both state agency facilities staff as well as elected and/or appointed officials and members of the private sector who have an interest in green building for the state.

Through formal facilitation, such a council could generate draft policies and program recommendations that could be used to rally support and identify potential sticking points with constituencies throughout the state. It could iteratively refine those drafts into policies with a high probability of executive or legislative success while generating momentum and enthusiasm among stakeholders of the policies. If Governor Sonny Perdue were receptive and supportive of such efforts, a formally appointed commission could achieve similar ends with even greater efficiency.

The outcome of a working group, be it voluntary or formally appointed, would be a broadly supported vision for what green building should look like for state-owned buildings in Georgia, plus a discrete and tangible action plan specifying intermediate steps necessary to achieve the vision. With sufficient iteration and refinement, those steps could be coupled with specific funding and implementation plans to support the execution of the entire action plan. The eventual result would be a broadly accepted and endorsed plan that could be issued as an executive order to motivate implementation. Consensus-based planning is likely to result in more willing and widespread adoption of green building goals and tactics than directives issuing from a single source. As such, the working group approach stands the best chance of developing a plan which will be successful in achieving the true goal of this project: increased sustainability for state-owned buildings in Georgia.

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**APPENDIX A:
STATE GREEN BUILDING PROGRAM CASE STUDIES**

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STATE OF ARIZONA GREEN BUILDING PROGRAM

State Policy or Guidance

On February 11, 2005 Governor Janet Napolitano signed Executive Order (EO) 2005-05 entitled “Implementing Renewable Energy and Energy Efficiency in New State Buildings.” The text relating to green buildings reads “All state-funded buildings constructed after the date of this Executive Order shall meet at least the ‘silver’ Leadership in Energy & Environmental Design (LEED) standard.” The EO does not state whether or not agencies must seek formal certification from the USGBC or if it is sufficient for them to simply follow the guidelines; the intent of the EO was to require certification. There is no formal mechanism for enforcement of the mandate; compliance will be voluntary.

Background

Various efforts around the state helped to create support for green buildings. In 2002, the Arizona Department of Environmental Quality (DEQ) completed construction on an energy efficient 300,000 ft² building, which has been submitted to the USGBC for review. While this building predates the Governor’s EO by three years the DEQ made the decision to go green because of the mission of its organization. Several state universities also had green building programs prior to the EO, including Arizona State University and Northern Arizona University.

The interest in making state buildings more sustainable likely resulted from work conducted by the Governor’s Energy Efficiency & Renewable Energy Working Group that met over the course of several months to develop an energy policy for the state. Through the course of their work they identified green building as a potential area for improvement. The local chapter of the USGBC gave a presentation on green buildings to the Working Group and made the case for a statewide green building policy.

The Working Group conducted research and submitted relevant articles and studies to the Governor to address concerns that green buildings were costly. The findings of certain studies suggested that if started early enough, a green building can be completed with no additional cost. Other studies suggested that LEED could cost 5-6% or more depending on the LEED level pursued. Most articles suggested that a target rating of Silver would require minimal extra costs, which inspired the language in the EO.

Barriers

Agencies and their design contractors were concerned about how much additional cost or schedule time the EO would require. This barrier, resulting from fear of the unknown, was overcome by providing the Governor’s office with articles documenting the costs and benefits of green building. Concerns over other uncertainties were also eased by an inventory of other states, cities and government agencies that joined the USGBC and

adopted LEED policies. This study was provided to the Governor. Fortunately there were no lobbies that posed resistance to the policy, as has occurred in other states.

Green Building Activities within Arizona State Agencies

A number of different local governments across Arizona have initiated green building programs. For instance, Apache Junction (a community to the east of Phoenix) has decided to build its new city hall and its new multi-generational center green. The Grand Opening ceremony for these two buildings was held October 2005. The City of Tucson has been very active in having some of its buildings registered. The City of Tolleson west of Phoenix, is attempting to certify two new buildings at LEED Platinum standards. Previously, the Phoenix City Council established green guidelines for their facilities. The City of Scottsdale passed a resolution in early 2005 requiring all new city facilities and remodels be certified at the LEED Gold level, making it the first city in the country to set such a high standard. The City of Scottsdale has been very active in residential green building since 1998 and local universities have followed suit. The city of Scottsdale, although its initiatives initially targeted residential construction, has served as a model for other Arizona municipalities.

Lessons Learned

In order to promote green buildings, it is helpful to develop a showcase or model project, such as the Arizona DEQ building. This is an excellent method for overcoming uncertainty and building support. Green building advocates were able to capitalize on the DEQ's need for a new building and to channel the synergy between green building and DEQ's mission. Arizona also benefited from having a strong local chapter of the USGBC that was very active in holding seminars on the topic and responding to questions from the Governor's office.

Representative Projects

As of summer 2005, there were three state buildings (a new state archive, headquarters for the Department of Game and Fish, and a Department of Economic Security building) from three different agencies in the design process and all three have incorporated LEED language into the bid package.

The Arizona DEQ building in Phoenix, completed in July 2002, was designed to be LEED certified and is expected to achieve either the Certified or Silver level. The building is very energy efficient – utility bills have been about \$1.16/ft² versus about \$1.50/ft² for a conventional Phoenix-area building built in the same year. In addition, the local utility installed a 100 kW photovoltaic on the roof of the parking garage to demonstrate renewable energy. The building has performed very well as an efficient building, a useful showcase and an educational tool.

Related Web Links

Executive Order 2005-05

http://www.governor.state.az.us/eo/2005_05.pdf

New Release: "Scottsdale becomes first city in the nation to adopt gold standard for energy and environmental design."

<http://www.scottsdaleaz.gov/news/2005/March/03-24-05b.asp>

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STATE OF CALIFORNIA GREEN BUILDING PROGRAM

State Policy or Guidance

On December 14, 2004 Governor Arnold Schwarzenegger signed Executive Order S-20-04, strengthening the impact of California's green building program, which was initiated by Governor Davis with EO D-16-00 in 2000. Governor Schwarzenegger's EO focuses on reducing energy consumption 20% in buildings owned, funded or leased by the state by 2015 through a number of different directives. The most significant and explicit directive in the executive order requires that all new or renovated state-funded and state-owned buildings achieve a minimum LEED Silver certification, effective immediately.

Building on the efforts of the Sustainable Building Task Force formed under Governor Davis, the Green Action Team created a Green Building Action Plan. The following three details come from this plan. First, LEED certification (Silver or higher) is considered mandatory for all new state funded buildings over 10,000 ft². Second, smaller buildings are encouraged to use the same design principles as LEED but are not required to seek certification. Finally, the Action Plan addresses existing buildings by setting a requirement that all state owned buildings over 50,000 sq ft will meet LEED-EB standards by 2015 to the "maximum extent cost-effective."

Certain agencies that are not under the Governor's authority, such as the University of California, California State University, California Community Colleges, constitutional officers, legislative and judicial branches, and the California Public Utilities Commission, were asked to voluntarily participate. There is also language specifically asking the Division of the State Architect to adopt guidelines by December 31, 2005 that would "enable and encourage schools built with state funds to be resource and energy efficient."

Background

Initial green building efforts in the state can be attributed to the California Integrated Waste Management Board (CIWMB), which began promoting green technologies during the construction of its new building. While CIWMB was only able to get a commitment for integrating sustainability features into the project late in the design, it was able to get a building that was more efficient than average, and the process galvanized support for green buildings statewide. Support for green buildings grew further as a result of the positive experience of the Capital Area East End Office Complex that received a LEED Gold certification at no additional cost. It was also helpful that the building could demonstrate lower energy costs at a time when energy prices were at an all time high.

In 2000, Governor Davis issued Executive Order D-16-00 establishing a goal for state government to employ sustainable construction features and techniques. Specifically, the EO requested that the Secretary for State and Consumer Services consult with a broad range of stakeholders to develop recommendations for how to incorporate sustainable building practices into facilities built or leased by the State.

As a result of the executive orders issued by Governor Davis, a Sustainable Building Task Force (SBTF) was created. The SBTF is made up of representatives from over 40 government agencies that affect public buildings in the state. The Task Force has created a multi-pronged program that targets policy, education, training, research and recognition at varying governmental levels. After Governor Schwarzenegger took office he created a Green Action Team with cabinet level representatives to work out the details and create guidance documents.

A bill was passed by California legislature that would have made EO D-16-00 law. Governor Schwarzenegger vetoed this bill and instead wrote a green building executive order with stronger language, but with less enforcement power behind it.

Barriers

There were few barriers encountered in the pursuit of a green building program in California. Contractors were initially concerned about using innovative technologies but were eventually won over after some successful demonstration projects.

Green Building Activities within California State Agencies

To assist designers in meeting the state's green building goals, the Sustainable Building Technical Group developed a supplement to LEED for state facilities in 2001, even though LEED certification was not required by state policy at the time. The document includes specific requirements that go beyond LEED and requires that certain LEED credits above the prerequisites be mandatory.

The Excellence in Public Buildings Program was adopted by Department of General Services in 2004. This initiative includes the following eight goals for buildings under DGS control: 1) Architectural Excellence, 2) Sustainability, 3) Integrating Art into Public Buildings, 4) Cost-effectiveness, 5) Universal Design, 6) Safety and Security, 7) Making a Positive Contribution to the Local Community, and 8) Preservation of Buildings of Historic Value.

In addition to these measures, the University Of California Board Of Regents developed a Green Building Policy and several school districts have voluntarily adopted the Collaborative for High Performance Schools Best Practices Manual in order to improve the sustainability of educational facilities.

Lessons Learned

The most critical factor for success is having a high level internal champion willing to take risks to promote green building. Continuity in the program is also critical. The program in California benefited from bringing in numerous stakeholders, such as government officials and contractors, in order to disseminate the risk. Because California prequalifies contractors, only a small pool of contractors are qualified for the large projects. This was considered a benefit because it meant that the overall learning curve was minimized.

Another key to success is to have some early wins that are very visible. Two large projects (Cal/EPA and the East End) received good press and had demonstrable operational savings, garnering more support for the program.

The number one weakness with the program is that there is no way to connect first cost with operating cost; there is no way to borrow against operations and maintenance costs for capital improvements.

Representative Projects

Capitol Area East End Office Complex benefited from broad interest from multiple state agencies. Not only was the building attractive, but it also demonstrated significant financial savings. The building was completed right as the major energy crisis hit, making the calculations of \$450K per year in energy savings from this complex especially significant.

Cal/EPA Headquarters building completed in April 2001 in Sacramento was widely considered a success despite the fact that it was far along in the design process before it was determined that it would be a green building showcase. The greening of this project was driven by the values of the future tenant.

Related Web Links

Green Building Design and Construction

<http://www.ciwmb.ca.gov/GreenBuilding/>

Sustainable Building Task Force

<http://www.ciwmb.ca.gov/GreenBuilding/TaskForce/>

Governor's Executive Order S-20-04

http://www.governor.ca.gov/state/govsite/gov_htmldisplay.jsp?sFilePath=%2fgovsite%2fexecutive_orders%2f20041214_S-20-04.html&sCatTitle=Press+Release

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STATE OF COLORADO GREEN BUILDING PROGRAM

State Policy or Guidance

On July 15, 2005 Colorado Governor Bill Owens signed Executive Order D 005 05 entitled 'Greening of State Government.' This EO directs all state agencies to adopt LEED for both new and existing buildings where applicable, practical and cost-effective, leaving it up to the agencies themselves to make this determination. The EO covers all state owned buildings with the exclusion of university buildings, since the Governor does not have authority over these facilities.

The Governor also created the Colorado Greening Government Coordinating Council to oversee and implement the EO. The council is jointly managed by the Governor's Office of Energy Management and Conservation, the Department of Public Health and Environment, and the Department of Personnel and Administration. The Council is in the process of pulling together a meeting with representatives from all state departments to discuss and implement energy and environmental practices. Each agency is required to submit a list of their greening projects, along with costs and benefits, to the Council annually.

Background

Governor Owens already had a track record in support of green state facilities. In 2003, the Governor signed Executive Order D 014 03 Energy Performance Contracting to Improve State Facilities, which required that all state agencies evaluate the feasibility of using energy performance contracts in their facilities to save money and energy. The EO provided for free technical assistance from the Governor's Office of Energy Management and Conservation to assist with implementation.

The Office of Energy Management and Conservation (Colorado's state energy office) is under the Governor's office, giving representatives direct access to the Governor. The state Department of Public Health and Environment approached the State Energy Office with the idea to draft the EO, which the Governor readily supported.

The year before the EO was issued, a group of local environmentalists and architects attempted to get legislation passed that would have required LEED for state facilities. While there was a lot of support for green buildings and the LEED process it was not agreed that it was useful to require LEED certification on all buildings due to the effectiveness and popularity of voluntary programs.

Barriers

Commissioning has been a barrier due to the lack of understanding regarding the value it presents in relation to the high upfront cost. The Office of Energy Management and Conservation has tried to address this concern through the provision of training and other resources to explain the benefits of commissioning.

There was considerable opposition to the bill that would have required LEED certification of all state buildings primarily because the bill did not offer enough flexibility.

Green Building Activities within Colorado State Agencies

The Colorado Office of Energy Management and Conservation offers a variety of programs that support green building efforts for public and private entities. They have a very successful Rebuild Colorado program that provides free technical assistance to all public agencies in the state of Colorado to support energy performance contracting. They also offer grants from \$10,000 to \$25,000 to help local or state government agencies incorporate LEED into their design. Their office is in the process of producing a guidebook for how to implement LEED in Colorado based on strategies that have worked given the unique climate, utility costs, typical payback, construction styles, et cetera.

The University of Colorado at Boulder is building LEED principles into their university design guidelines to ensure that all new buildings meet LEED Silver guidelines at minimum, though they will not be seeking formal certification. There are several residential green building initiatives in Colorado such as the non-profit E-Star Colorado, and the Built Green program for residential construction in Denver.

Lessons Learned

Overall, Colorado found that giving grants to state agencies to allow them to hire outside technical experts was a much more effective approach than the previous attempts to provide technical assistance directly through the state energy office. This had two benefits, getting the agencies the help needed to make buildings more sustainable and supporting the market place of competent experts.

Giving grants has value beyond the monetary impact; it is a sign of the Governor's commitment to invest in green building. This helps schools make the case for green to their board and constituencies. An additional benefit of the grant program is that it allows the Office of Energy Management and Conservation to be involved in documenting successes, lessons learned, cases, and to share these lessons with others. Another key to their success was working both sides of the supply and demand equation – educating customers and end users to ask for the best of their architects, coupled with creating a strong market where there are assets to respond to that demand. One of the most important lessons learned is how important it is to build internal support for LEED before getting the Governor to issue an EO.

Representative Projects

The state has registered their 40,000 ft² addition to the Colorado Department of Labor and Employment. This project has benefited from a \$25,000 grant from the State Energy Office for sustainable design services.

Related Web Links

Executive Order D 005 05 Greening of State Government

<http://www.colorado.gov/governor/eos/d00505.pdf>

Executive Order D 014 03 Energy Performance Contracting to Improve State Facilities

http://www.state.co.us/gov_dir/govnr_dir/exec_orders/d01403.pdf

Rebuild Colorado

<http://www.colorado.gov/rebuildco/>

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STATE OF MAINE GREEN BUILDING PROGRAM

State Policy or Guidance

In November 2003, Governor John Baldacci signed an Executive Order that requires the use of the LEED Green Building Rating System for all new or expanded state facilities (including higher education), provided that it is cost-effective when life cycle costs are considered. Official LEED certification is not required. Renovations, operations and maintenance must incorporate LEED-EB standards. School districts and municipalities are exempt from the requirements of this order, but a Memorandum of Agreement dated August 11, 2003 addresses resource efficiency of buildings constructed by these organizations.

Background

Much of the activity surrounding green building in Maine was generated by the enthusiasm of an attendee of the first USGBC conference in Austin, Texas in 2002. Shortly thereafter, a group of supporters established a Maine chapter of the USGBC. Prior to the signing of the EO, there was little experience in Maine with green building. One state facility, the Baxter School for the Deaf, was being designed and constructed using LEED, as the architect had convinced the owners that it would be more cost effective. One of the key players within the Office of Buildings and Maintenance became a strong supporter of the EO. High energy costs also helped make green buildings more attractive to the administration. In addition, Governor George Pataki in neighboring New York had signed a green building EO in 2001.

Barriers

The signing of the EO was a surprise to many in the building community and many of those to be affected lacked knowledge on the topic. Building contractors, primarily, objected stating that it would cost too much to implement the LEED process in construction. There appeared to be a fear of trying new things, since some innovative products in the past, such as asbestos insulation, later proved to be a poor choice. The state provided several training courses on green building techniques, including official LEED training conducted by USGBC trainers, as well as other courses taught by volunteers with the knowledge and experience to train the building community. Most architecture firms were already on board, along with universities who had been striving for more energy efficient buildings. One of the tough decisions was whether or not to require LEED certification. Since the State was not likely to provide funding for registration and certification, it seemed unwise to require it.

Green Building Activities within Maine State Agencies

The state has an active USGBC chapter and local experts. The Green Campus Consortium of Maine is an organization that maintains a list serve and conducts workshops, conferences and focused meetings to improve sustainability through

education and communication among institutes of higher education. Additionally, a group of engineers has volunteered to assist schools with energy audits and related items. One school saved approximately \$900 per month by encouraging more efficient occupant behavior.

Lessons Learned

It is important to have the support of key agencies, such as the Office of Buildings and Maintenance, to integrate green building into the business of state agencies. Supporters in critical job positions are invaluable for promoting sustainability. It is also vital to involve agencies that will be affected by the policy, such as school districts. Since the state provides approximately 85-90% of the funding for schools, it would have been helpful to have worked more closely with them prior to passing the EO.

Representative Projects

Baxter School for the Deaf

Related Web Links

Executive Order: An Order Regarding The Use Of “LEED” Building Standards For State Buildings

<http://www.maine.greenpower.org/tools/ExOrder-LEEDbldgs-11-03.pdf>

Article by Michelle Cavallero, MainBiz, May 2, 2005. “It’s not easy being green”

http://www.harriman.com/nav_images/not_easy_being_green-low.pdf

Green Campus Consortium of Maine. “GCC Tour of Maine’s first LEED rated building”

<http://www.megreencampus.com/BaxterTour.html>

Article called “Maine Adopts Leadership in Energy and Environmental Building Standards.” November, 2003.

<http://www.usgbc.org/chapters/maine/details.asp?ID=977>

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STATE OF MARYLAND GREEN BUILDING PROGRAM

State Policy or Guidance

In 2001, then-Governor Parris Glendening signed an Executive Order promoting the procurement of green power for use in state facilities and the development of a high efficiency green building program. The EO established a goal that 6% of energy used in state facilities should be derived from green sources (wind, solar photovoltaic, solar thermal, biomass, landfill gas and the combustion of municipal solid waste), with no more than 50% of the green energy total derived from solid waste combustion. As part of the green building program, the State established a Maryland Green Building Council led by the Secretary of the General Services Administration that included a representative from each of the following agencies: Department of Budget and Management; Department of the Environment; Department of Natural Resources; Department of Public Safety and Correctional Services; Department of Transportation; Department of Housing and Community Development; Department of Planning; Maryland Energy Administration; Public School Construction Program; and, University System of Maryland. Other members of the Council included 6 persons appointed by the Governor to represent environmental, business and citizen interests.

The EO also required the Council to make a recommendation within 180 days regarding the use of green building standards and rating criteria (LEED Silver certification was selected) to be used by State agencies. Other duties assigned to the Council included: annual reevaluation the Clean Energy Procurement Goal; consideration of additional state energy efficiency, energy production and sustainability issues and policies; development of a comprehensive set of initiatives known as the "Maryland Greenhouse Gas Reduction Action Plan"; and, publication of an annual report to the Governor and to the General Assembly on the efforts of State agencies in the implementation of High Efficiency Green Buildings Program goals, Clean Energy Procurement Goal, the Greenhouse Gas Reduction Plan, and other energy efficiency, energy production and sustainability issues or policies the Council may have considered. The EO also set other State goals including: a 10% reduction of energy use in state facilities by 2005 and 15% by 2010; expansion of renewable energy and participation in the Million Solar Roofs program; the purchase Energy Star labeled products; diversion or recycling of 20% of the waste generated by state agencies; and, revision of fleet policy to support the use of alternatively fueled vehicles.

Background

Former Governor Glendening was a strong advocate of Smart Growth and high performance buildings. While the policy of Smart Growth is to reinvest in urban areas, that should not result in an environmental trade-off to rural areas. Accordingly, environmental design efforts were driven by the phrase, "how we build is just as important as where we build." For several years prior, there were many programs and

policies enacted to protect the Chesapeake Bay and other environmental resources. Although there was some resistance among agencies, they realized the importance of supporting the Governor's green building goals. The EO was signed and acted upon vigorously for a couple of years. Green building activities in the state have been slower in recent years due a shift in priorities under the current administration.

Barriers

As is typical with EOs, an incoming administration is likely to focus less on those directives developed by a previous administration and concentrate on other priorities. Therefore, the momentum created by an EO that is passed may wane in the years to come if these policies and practices are not institutionalized before a new administration takes office. Strong leadership from the top or a large group of supporters from the bottom will be required to make green building efforts successful. Unfortunately the state has only a handful of employees who are available to provide technical assistance for agencies and other groups in the state pursuing green building at this time. In recent years, other green building related legislation has been proposed with only a couple enacted. This is due in large part to the misperception of increased costs for green building, a general ignorance of policy makers and elected officials of the capital projects process, and trade associations that have opposed it. Still, those bills with leadership support did get passed.

Green Building Activities within State Agencies

After the EO was signed, the legislature supported two pilot projects, one at a university and one in a state park, which are still in design. For commercial buildings, the State of Maryland offered a green building tax credit for up to 8% of the total project cost for new and rehabilitation projects that meet specific criteria, including LEED Silver certification. At the time of this writing, nearly 70% of the money set aside for tax credits had been spent.

Lessons Learned

The two major green buildings projects implemented by Maryland showcase the opportunities and pitfalls of a state government implementing high performance facilities. The first project is the Montgomery Park facility in Baltimore. Maryland released a request for proposals with specific energy efficient requirements. A developer submitted a proposal for a green building and supported smart growth efforts by rehabilitating a longtime dormant Montgomery Ward warehouse in Baltimore. The building would rate LEED Silver if submitted, and now houses the Department of the Environment and other state agencies. The second facility is the Department of Transportation. The challenge was that green design approaches and techniques were injected late in the design process, consequently increasing the cost of greening the facility and perpetuating the false impression that high performance buildings intrinsically cost more. Further, another lesson learned is that an agency must be careful in selecting green products by considering both fiscal and political realities. For example, the architect designed men's restrooms with waterless urinals manufactured in Australia. When the parts needed replacing, however, they were difficult to obtain, resulting in skepticism among operations and maintenance employees and policy makers about the value of green

buildings in general. The economic benefits of green buildings clearly provide the most convincing arguments for encouraging agencies and other building owners to design and construct more sustainable facilities. Agencies with a “low bid” mindset are harder to convince. Still, policy makers must recognize the real-world and image constraints of high performance buildings.

Representative Projects

Saint Mary’s College New Academic Building, St. Mary's City, Maryland (Gold) and the Beach Services Building, Gun Powder State Park, Maryland Department of the Environment Office Building (former Montgomery Ward warehouse)

Related Web Links

Maryland Environmental Design Program home page

<http://www.dnr.state.md.us/ed/index.html>

Maryland Energy Administration Green Building Tax Credit

<http://www.energy.state.md.us/programs/commercial/greenbuilding/index.html>

Maryland Energy Administration Solar Energy Grant Program

<http://www.energy.state.md.us/programs/renewable/solargrant/index.html>

Executive Order 01.01.2001.02 Sustaining Maryland's Future with Clean Power, Green Buildings and Energy Efficiency

<http://www.dsd.state.md.us/comar/01/01.01.2001.02.htm>

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STATE OF NEVADA GREEN BUILDING PROGRAM

State Policy or Guidance

The state of Nevada passed Assembly Bill No. 3 (AB3) in June 2005 (signed in July). The primary focus of this act, which affects several existing statutes, is energy. The implementation dates vary for the requirements imposed. A summary excerpted from the bill states:

AN ACT relating to energy; making various changes to encourage energy efficiency in construction and renovation; providing for a partial abatement of certain taxes for certain energy efficient buildings and green buildings; requiring the University and Community College System of Nevada to provide instruction in certain areas related to green buildings; providing for the licensure of certain persons engaged in photovoltaic system projects; requiring the Director of the Office of Energy to adopt certain regulations, plans and guidelines regarding building standards and energy efficiency; requiring the State to reduce its grid-based purchases for state-owned buildings; increasing the number of members of the Task Force for Renewable Energy and Energy Conservation; revising provisions relating to the universal energy charge and the Fund for Energy Assistance and Conservation; revising provisions governing the portfolio standard for renewable energy and energy from a qualified energy recovery process; allowing a provider of electric service to receive credits under the portfolio standard for certain energy efficiency measures; authorizing the Public Utilities Commission of Nevada to establish a temporary renewable energy development program for certain purposes; enacting provisions concerning the financial impact of certain long-term contracts required by the portfolio standard; revising the Solar Energy Systems Demonstration Program Act; transferring certain funds to the Trust Fund for Renewable Energy and Energy Conservation; providing penalties; and providing other matters properly relating thereto.

According to the law, each occupied public building sponsored or financed by the state must “meet the requirements to be certified” under LEED or an equivalent rating system as adopted by the Director of the Office of Energy. Additionally, during each biennium, at least two public buildings designated as demonstration projects must meet LEED Silver (or equivalent) requirements. Occupied public buildings include those used primarily as office or work spaces and exclude storage and warehouse facilities (and similar buildings). For state buildings larger than 20,000 ft², the state must obtain a life cycle cost analysis for constructing (or renovating), operating and maintaining the building for its expected life. This analysis must also identify measures for water and energy conservation or the use of renewable energy that will have a pay back period of 10 years or less. The analysis must be used by the proposing agency in deciding upon the type of construction or renovation and the components and systems to include in the facility. The law also allows for the agency to select a contractor to conduct the analysis and to purchase or lease cost-saving measures that will be paid for through cost savings

(also known as energy saving performance contracting). The law provides a tax incentive to encourage the private sector to design and construct LEED Silver certified (or equivalent) facilities. The Commission on Economic Development (CED) will grant partial property tax abatement for not more than 10 years and not to exceed 50% of the taxes on real property. The CED must develop the qualifications and methods for eligibility. Additionally, there is a sales tax exemption for products related to green building, including: products adapted to use renewable energy to generate electricity; solar thermal energy systems; solar lighting systems; and materials used in the construction of a building that meets requirements to be certified at LEED Silver level or higher. In order to equip future building professionals to design and construct green buildings, the legislation also requires that the University System provide students with the essentials of green building design and construction to help them prepare to become LEED accredited professionals.

The purpose of the pilot project is to promote educational attributes of the buildings. Two LEED Silver projects must be developed every two years and they should be accessible to the public. The state public works group was opposed to the law and did not want to have every building certified. As a result, the compromise bill requires that every state building be LEED certified (at the lowest level) and requires that at least two buildings per session to go all the way to LEED Silver. All buildings must formally go through LEED certification. As a compromise to LEED opponents, the legislation also includes “or equivalent” language. The local USGBC chapter is promoting LEED, but is awaiting a decision to see what rating system is selected.

Background

Although there has been an active USGBC chapter in Las Vegas for several years, the legislation was primarily top-down driven, with Assemblywoman Christina Giunchigliani proposing the legislation and moving it forward. For several years, she, Senator Dina Titus, and others have been promoting energy-related legislation. There has been some opposition to items in the recently passed law and many amendments were made to reach a consensus.

Barriers

There was opposition to the bill by several entities. The signed legislation includes provisions to appease the opposition. For example, local governments (and schools) are encouraged but not required to design to LEED standards. There was some opposition to having every building certified at the LEED Silver level, so the requirements was changed to LEED certified (at the lowest level), with the requirement that demonstration projects will reach LEED Silver. As a compromise to LEED opponents, the legislation also includes “or equivalent” language. The local USGBC chapter is promoting LEED, but is awaiting a decision to see what rating system is selected. There is some guidance about what an equivalent rating system must address. Some municipalities opposed the tax abatement portion of the law since that directly influences their finances. The law was recently passed, so it is still not clear what other barriers will arise and how these issues will be addressed by the state. Barriers anticipated include how the colleges and universities will fund the education of students to prepare them for the LEED

accreditation exam, although there is support (not financial) to do this and it will most likely be successful. Another barrier that may emerge is related to enforcement and compliance of agencies. Each agency is “self-policing” and bad publicity for non-compliant agencies could be damaging. However, whether or not this is incentive enough to ensure compliance is unknown at this time.

Green Building Activities within State Agencies

Other notable green building activities in Nevada include the aforementioned USGBC chapter of the Las Vegas area, the Green Building Working Group with the Southern Nevada homebuilder’s association, and renewable energy incentives at \$3/watt for solar and wind energy issued by the power companies (as mandated by the state). In Nevada, green building activities have begun to flourish, particularly in the past two years.

Lessons Learned

It is important to have a strong champion of green building legislation, preferably in both houses. Although legislation is more difficult to pass than an Executive Order, it is capable of becoming more all-encompassing. The likelihood of passing a law is greater when there is a proactive approach to removing opposition and answering questions sufficiently to turn opponents into proponents. For example, in Nevada the Association of General Contractors is a very strong lobbying group that originally opposed the bill. Once more information was provided, the Association removed its opposition and now supports the legislation. Compromising is important in developing successful legislation. The time, dedication and focus necessary to succeed is enormous. The local USGBC was somewhat unprepared for legislation to pass this year and members, who are volunteers, had to quickly mobilize a diverse array of stakeholders to produce results in a timely manner.

Representative Projects

The state of Nevada is not currently home to any LEED certified projects, but several structures are registered. Private developments, the MGM Mirage City Center project and the Molasky Properties project have received high visibility and will be LEED certified in the future. Additional projects both built and in development are as follows:

- Las Vegas Springs Preserve (LVSP), Visitor Center, Targeting LEED-NC Silver, Las Vegas Valley Water District, Las Vegas, NV. Currently in construction, Opening spring 2007
- Las Vegas Springs Preserve (LVSP), Desert Living Center & Gardens, Targeting LEED-NC Platinum, Las Vegas Valley Water District, Las Vegas, NV. Currently in construction, Opening spring 2007
- Molasky Corporate Center, Targeting LEED-NC Certified, Las Vegas, NV. Starting construction in late 2005 or early 2006.
- Regional Animal Campus, Targeting LEED-NC Platinum, The Animal Foundation, Las Vegas, NV. Construction complete

- Telecommunications Building, Targeting LEED-NC Silver, Community College of Southern Nevada, Las Vegas, NV. Completed construction, August 2004, and awaiting LEED Certification

Related Web Links

Assembly Bill No. 3 (as amended)

http://www.leg.state.nv.us/22ndSpecial/bills/AB/AB3_EN.pdf

Article by Ryan Slattery, June 2005. "Nevada passes LEED legislation"

http://www.usgbc.org/News/usgbcnews_details.asp?ID=1666&CMSPageID=161

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STATE OF NEW YORK GREEN BUILDING PROGRAM

State Policy or Guidance

New York Governor George Pataki signed Executive Order 111 on June 10, 2001. The title of the EO is “Green and Clean State Buildings and Vehicles.” The EO directs all affected state agencies to follow the LEED guidelines in the ‘design, construction, operation and maintenance of new buildings.’ State agencies are not required to seek certification through the USGBC but are required to maintain documentation that they have followed the guidelines. There is no mechanism for enforcing compliance, but agencies are asked to submit an annual energy report for all their facilities.

Occupied buildings greater than 20,000 ft² must meet the standards to be LEED certified and must also meet several additional criteria laid out in the green building tax credit regulations. Occupied buildings between 5,000 and 20,000 ft² must “incorporate significant attributes of green building design principles.” Buildings smaller than 5,000 ft² are exempt from the requirement. Rehabilitation and renovation projects are required to meet similar levels of LEED for Existing Buildings; however these projects are allowed more leeway.

The EO established a Green Building Working Group, with representatives from NYSERDA, the Dormitory Authority, Office of General Services, Department of Environmental Conservation, NYC Transit Authority, Metropolitan Transit Authority, and the State University Construction Fund that developed green building guidelines that must be followed in addition to LEED.

Background

Executive Order 111 was truly the Governor’s initiative, although there were several projects that built support for green building in the state that may have helped to inspire the EO. Craig Kneeland, Senior Project Manager with New York State Energy Research and Development Authority (NYSERDA) was encouraged to attend the U.S. Green Building Council’s first national conference in 1994 and subsequently became a champion for sustainable construction. The State of New York was later awarded a grant by the U.S. EPA to provide technical assistance (energy modeling and materials analysis) for three projects: two public schools (one in NYC, one in the Albany area) and a public library.

More support was given to sustainable buildings in 2000, when the Governor created the first statewide green building tax credit program in the U.S. While this program benefits private builder owners, it helped to increase support and development of skills for green building practices for all construction types. Even more critical to the success of the EO was the commitment by the Battery Park City Authority in 2000 to require all new

buildings to be green. Although this program also applied only to private sector projects it created an experience and knowledge base upon which the EO could be built.

Barriers

There was significant resistance from several industry groups over specific language in the green building tax credit legislation. Most notable was the lawsuit, ultimately withdrawn, from the Resilient Floor Covering Institute over the lack of provisions for vinyl as a green flooring. Other groups argued over refrigerants (which cause global warming) versus ozone depleting refrigerants, and forest products companies complained about certified wood provisions.

Another barrier to implementation of EO 111 was the general resistance to what was considered a seemingly radical idea and that no additional funding was provided by the state to agencies to cover what they perceived as additional effort. The State Comptroller's Office, which must approve state capital construction projects, is set up traditionally to review only first capital costs, not life-cycle costs.

Green Building Activities within State Agencies

New York State has offered developers a tax credit for incorporating sustainable design features into their buildings since 2000.

The Battery Park City Authority has developed green design guidelines for residential and commercial/institutional developments. Their efforts helped to build support for the state's green building program. In other efforts NYSERDA, the Dormitory Authority, State University Construction Fund and the University at Buffalo cofunded New York city's *High Performance Building Guidelines*.

NYSERDA runs a very innovative and successful technical assistance program called FlexTech. Through this program NYSERDA approves a list of qualified providers in various fields of expertise and makes these contractors available to a multitude of clients to perform customized technical assistance on a cost-share basis. The FlexTech program was the beginning of the Green Building Program at NYSERDA. Since September of 1999, virtually all of its funding now comes from the New Construction Program, which is supported by the System Benefits Charge. NYSERDA is the third party administrator of these funds, which total \$150 million per year.

New York City has a very active Office of Sustainable Design in their Department of Design and Construction. Through this office they have produced valuable design guidelines and have provided assistance to multiple green building projects throughout the New York City area

Lessons Learned

Green building efforts need internal champions to promote and sustain programs. It is necessary to connect funding sources with interested project participants and technical experts.

Information infrastructure is critical for providing people with the resources they need once they are motivated to act. NYSERDA found that with their FlexTech program they were able to build a green network and increase both capacity and market demand for green building in New York.

Representative Projects

SUNY Buffalo has two or three LEED buildings on campus, the Department of Environmental Conservation, in partnership with the Office of General Services, has projects seeking LEED certification in multiple locations around the state, the Department of Transportation has a LEED Silver project, and SUNY Binghamton has two EO 111-compliant dormitories.

Related Web Links

New York State Energy Research and Development Authority

<http://www.nyserda.org/>

Executive Order No. 111 “Green And Clean” State Buildings And Vehicles Guidelines

http://www.nyserda.org/programs/State_Government/exorder111guidelines.pdf

New York City Department of Design and Construction Office of Sustainable Design

<http://www.nyc.gov/html/ddc/html/ddcgreen/>

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COMMONWEALTH OF PENNSYLVANIA GREEN BUILDING PROGRAM

State Policy or Guidance

In March 1998, then-Governor Tom Ridge signed an Executive Order establishing the Governor's Green Government Council (GGGC). The purpose of the council is "to cooperatively across agency jurisdictions, facilitate the incorporation of environmentally sustainable practices, including Strategic Environmental Management, into Commonwealth government's planning, operations, and policymaking and regulatory functions, and to strive for continuous improvement in environmental performance with the goal of zero emissions." The council is responsible for providing assistance to state agencies with prioritizing sustainability initiatives and for assisting them with developing Green Plans. The Green Plans include agency-specific information about initiatives in areas such as land use planning, green purchasing, green buildings, green power, transportation and recycling. The council is jointly chaired by the Secretaries of the Departments of General Services and Environmental Protection and includes other individuals as appointed by the Governor. All agencies are encouraged to participate in the council's efforts. Currently, the GGGC employs four individuals to advance sustainability throughout the state and to ensure that the intention of the EO is carried out in Pennsylvania. The GGGC's technical staff provides free technical assistance to any state agency that is interested. They help with defining goals, selecting designers, facilitating charrettes, and following projects all the way through completion. Occasionally, the GGGC provides assistance in balancing project budgets without eliminating key sustainable features and negotiating building codes and standards (e.g., going before plumbing review boards regarding waterless urinals). The largest number of requests the GGGC receives for assistance is actually placed by non-state entities. Although there has been a change of administration since the signing of the EO, the council remains very active. Since there is no enforcement mechanism in the EO to ensure that agencies participate, the GGGC promotes green building and related activities by convincing agencies of their merits. There has been sufficient buy-in such that the state of Pennsylvania has become a leader in the area of green building.

Background

The Secretary of the Department of Environmental Protection in 1998 is credited with pushing forward the initiative to form the GGGC by EO. There was support from the top to make it happen. Under the direction of Katherine Brownlee, the GGGC has made great strides in the area of green building and related programs.

Barriers

One of the greatest barriers to green building in Pennsylvania is the misconception that green buildings cost more to construct. There are some agencies with a "low bid" mindset that creates resistance to green building. Also, some agencies have constructed LEED

facilities that were not well designed, resulting in poor performance of those buildings. This is more likely to occur when an agency has little control over the selection of the design team and as a result those who work on its projects are often inexperienced with green building. Another barrier to green building is that some agencies do not want to spend money on LEED certification. The GGGC is working on a protocol based on Total Quality Management principles in order to reduce the administrative burden on agencies and still be able to audit buildings to make sure that LEED design principles are followed.

Green Building Activities within State Agencies

State agency initiatives are described in more detail in the Green Plans, but recent activity includes the Department of Environmental Protection's occupying three green offices, the Pennsylvania Housing Finance Agency Headquarter building, West Chester University School of Music and Performing Arts Center and facilities, and the Presque Isle State Park and Sproul Forest District facilities being developed by the Department of Conservation and Natural Resources. Pennsylvania state agencies are allowed to enter into energy savings performance contracts (terms up to 15 years). The administrative process is funded by the GGGC and the program is administered by the Department of General Services. In addition to these types of activities, the Pennsylvania Consortium for Interdisciplinary Environmental Policy, a group made up of both public and private colleges and universities, made a collective wind purchase that was the largest in the country. The Consortium is also focused on greening the curriculum so that graduates have an understanding of sustainability in hopes that they will become leaders who make a positive difference on the environment. There is a policy in Pennsylvania to apply a tiered approach to acquire 20% of all energy in Pennsylvania from sustainable sources by 2020. In 2004, the Commonwealth of Pennsylvania became an official Energy Star state partner.

Lessons Learned

Training, education and outreach are critical to the success of green building efforts in Pennsylvania. Because the EO lacks enforcement mechanisms, it is important to focus on the number one selling point about green buildings – cost savings. The GGGC provides technical assistance and “sells” green building, recycling, green procurement, and related programs to increase agency participation. Although LEED is a good green building rating tool, if used inappropriately by those who just want to earn points without much consideration of ensuring that the building is a good energy performer when completed, LEED buildings may not perform well. Therefore, some in the GGGC would like to see a mandate that requires LEED Silver certification *and* an Energy Star score of 85 points or higher. There are some green strategies that are more appropriate and acceptable in Pennsylvania than others and these should be pursued on a greater number of projects (such as rain gardens), thus some specific credits within LEED may become mandatory rather than optional. The success of the GGGC is due in large part to its synergy with the Department of Environmental Protection. Working as catalysts, together they create partnerships and networks to connect people with information, knowledge, and experts in the field.

Representative Projects

DEP Cambria Office Building (LEED Gold)
Clearview Elementary School (LEED Gold)

Related Web Links

Governor's Green Government Council Home page
<http://www.gggc.state.pa.us/gggc/site/default.asp>

Executive Order 1998-1
<http://www.gggc.state.pa.us/gggc/lib/gggc/documents/1998-1.pdf>

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STATE OF WASHINGTON GREEN BUILDING PROGRAM

State Policy or Guidance

Washington was the first state in the U.S. to *require*, by law, that state funded buildings be LEED certified. The 2005 Senate Bill 5509 requiring public buildings to be built using green standards was signed by Governor Christine Gregoire on April 8, 2005. At least LEED Silver certification is required, including new projects that are at least 5,000 ft² and major remodels where the cost equals at least 50% of the building's total assessed value. The requirement applies to all major facility projects funded in the capital budget or financed through a state financing contract. Major facility projects do not include transmitter buildings, pumping stations, hospitals, research facilities primarily used for sponsored laboratory experimentation, laboratory research, laboratory training in research methods or other similar building types as determined by the department. Also, an agency and its design team may determine that LEED standards (Silver or otherwise) are not practicable for use on specific projects. Reporting of operational savings of LEED projects is required as follows: annually (individual agencies) and biennially (consolidated report). The law also requires: the creation of an advisory committee; development of administrative guidelines (and adjustment of fee schedules) issued by the General Assembly and the State Board of Education (SBE); pre-proposal conferences and commissioning; and the adoption of implementing rules by the SBE. Other terms of the policy include: liability for design and construction teams acting in good faith is limited; wood products with a credible third party sustainable forest certification (not just FSC) or from forests regulated under the Washington Forest Practices Act must be credited; affordable housing is exempt; and the Joint Legislative Audit Review Committee is required to conduct a performance review of the high performance building program (including costs and savings) by December 1, 2010 (preliminary) and July 1, 2010 (final).

This policy applies to all projects entering into the design phase or the grant application process after the effective date, July 24, 2005. Public school districts are exempt until July 1, 2006 (for volunteering school districts), July 1, 2007 (for Class I school districts) and July 1, 2008 (for Class II school districts) and they may use the Washington Sustainable School Design Protocol instead of LEED. Also, affordable housing projects funded in the capital budget are exempt from LEED standards. By July 1, 2008 the Department of Community Trade and Economic Development (CTED) must adopt and administer an existing sustainable building program from 2009 to 2016 and CTED must annually report to the General Assembly.

Background

In January 2005, Governor Locke issued an Executive Order directing state agencies to incorporate green building practices. A previous EO signed in 2002 challenged state agencies to develop sustainability plans. As early as 1999, a local chapter of the USGBC was created. Several factors, such as the city of Seattle's requirement that all city

buildings be LEED certified, a growing enthusiasm among the design community and the Governor's positive position on sustainability created an environment in which the legislation was not difficult to pass.

Barriers

In spite of the growing interest and experience in the state of Washington in green building, there are still many who lack information about how to implement it successfully. Education is an important tool for overcoming this barrier. Additionally, the school systems had already developed a green building guide for schools based on the Collaborative for High Performance Schools rating system and they did not want to be required to use LEED (which is less school-specific). The Forestry industry was also opposed to requiring LEED because of one credit that credits only the use of wood certified by the Forestry Stewardship Council. These barriers were overcome by working with these groups to develop language that was acceptable to them. There are no apparent strong opponents to the law as passed at this time, although there are some concerns regarding the specifics of implementation.

Green Building Activities within State Agencies

Within the state, there are several existing programs that contribute to greening Washington's facilities. Seattle Sustainable Building is an organization that implements the city's LEED policy, provides incentives and assistance to Seattle businesses and residents to conserve resources, provides guidelines for city facilities with the Facility Standards for Design, Construction, and Operations (FSDCO) manual, and developed the "IMPLEMENT" tool to assist with green building. Local residential programs include Build a Better Kitsap and other city or county-wide residential programs using Built Green, which is a residential green building program developed in partnership with King and Snohomish Counties and other agencies in Washington State. The state has an active chapter of the USGBC, as well as an active AIA-Committee on the Environment.

Lessons Learned

The first attempt to pass green building legislation was not successful. It was necessary to work with opponents, such as the wood products industry and school systems, to create a bill that was amenable to them. There are still lessons to be learned regarding implementation since the law is new. Some of the specific details have not been worked through completely, such as how the term "not practicable" will be dealt with when agencies and their design teams deem that LEED Silver is not practicable on certain projects. The majority of state agencies in Washington are supportive of the legislation, and no major problems with implementation are anticipated. Because the legislature is likely to look unfavorably at those agencies seeking many exemptions, agencies most will likely move forward with LEED certification on their projects. There is a committee comprised of representatives from affected agencies that is working out some of the details and some forms have been created to track projects. For examples, one form is to be used by those seeking exemption from LEED certification and other forms are to be submitted at several building phases (pre-design, 50% design development, 50% construction documents, and post-construction).

Incentives, such as those provided by some of the utilities companies in Washington, are helpful for promoting green building. For example, one of the utilities will provide up to \$1.20 per square foot for beating the energy code by 25% and an additional 10% bonus if the project becomes LEED certified.

Representative Projects

None specified

Related Web Links

Certificate of Enrollment Engrossed Substitute Senate Bill 5509 (passed March 11, 2005)
<http://ssl.csg.org/dockets/26cycle/2006B/26bbills/0326b02wa.pdf>

Washington Votes: An overview of Senate Bill 5509 requiring public buildings to be built using green standards
<http://www.washingtonvotes.org/2005-SB-5509>

Washington LEED Quality Assurance Process
[http:// www.ga.wa.gov/eas/green](http://www.ga.wa.gov/eas/green)

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APPENDIX B: ANNOTATED BIBLIOGRAPHY ON THE BUSINESS CASE FOR GREEN BUILDING

City of Portland Office of Sustainable Development (2003). *ReThinking Development: Portland's Strategic Investment in Green Building*, City of Portland Office of Sustainable Development, Portland, OR.

Provides an overview of the city's green building accomplishments from 2000 to 2002. Report also includes strategic next steps to take their program into 2007. Central to their success was the establishment of a Green Building Division that adopted a policy and ordinance with LEED-based requirements for city-funded private sector development projects, as well as public-private partnerships and other programs that tied together several community and economic development initiatives.

Greenspirit Strategies, Ltd. (2004). "The Cost of Green: A Closer Look at State of California Sustainable Building Claims." The Engineered Wood Association, <http://www.apawood.org/level_b.cfm?content=pub_ewj_arch_f04_green> (Aug. 2, 2005).

This article critiques the "Costs and Financial Benefits of Green Buildings" report that was published by the California Sustainable Building Task Force. Their criticism focuses on the use of the LEED standard and the short-comings they see with the LEED system. They feel that the report does not reflect much of the literature that shows LEED certification as being more costly. They also take issue with the research design used to generate the report.

Johnston, David Ritchey (2000). "Actual Costs – Is Building Green Too Expensive?" *Building Green in a Black and White World*, New Society Publishers, Saint Paul, Minn., 59-62.

This excerpt from Mr. Ritchey's book refutes the claim that sustainable building practices are cost prohibitive and prevent inclusive housing practices. Three components of green buildings are priced: energy-saving techniques, healthy or non-toxic materials, and additional beneficial features. Mr. Ritchey shows that the additional costs are outweighed by energy savings, benefits to human health and the environment, and potential savings through the Energy Efficient Mortgage program.

Kats, G. (2003). *The Costs and Benefits of Green Buildings: A Report to California's Sustainable Building Task Force*. California's Sustainable Building Task Force, Sacramento, Calif., <<http://www.usgbc.org/Docs/News/News477.pdf>> (Nov. 1, 2005).

This report presents a comprehensive analysis of the financial cost and benefits of green buildings. The report explains how minimal initial investment of construction cost typically yields life cycle savings over ten times the initial investment.

Matthiessen, L.F. and Morris, P. (2004). *Costing Green: A Comprehensive Cost Database and Budgeting Methodology*. Davis Langdon SEAH International, Davis Langdon Adamson, ed.

This report, along with an abbreviated version entitled "Examining the Cost of Green," provides an analytical comparison of LEED-seeking vs. non-LEED-seeking buildings to draw conclusions about the cost implications of seeking specific LEED points as well as pursuing LEED overall. The conclusion of the study is that cost premiums associated with pursuing LEED are typically less than the variability in cost associated with "noise" in the data.

Muto, S. (2004). "Building Owners Forgo Being Certifiably 'Green.'" *Real Estate Journal: The Wall Street Journal Guide to Property*, <http://www.realestatejournal.com/columnists_com/bricks/20040414-bricks.html> (Aug. 2, 2005).

The Carnegie Institution's new Department of Global Ecology facility is a probable LEED-certifiable building that was not LEED-certified. The article explores why the owners and developers of many green buildings eschew LEED certification, in this case to invest in additional high-performance features. Other barriers include the arduous application and documentation processes.

Myers, T. (2005). *Should the State Follow LEED or Get out of the Way?* Washington Policy Center, <<http://www.washingtonpolicy.org/Environment/OPEDMyersLEED.html>> (Jul. 29, 2005).

Author questions the benefit for Washington State of a LEED policy requirement. Gives examples of a couple of green projects that are performing poorly. The author attacks a LEED credit that encourages the purchase of local materials (within a 500 mile radius), claiming that wood from British Columbia would be considered local and that since forestry standards in Canada are lower than in the U.S. this results in greater environmental damage.

Northbridge Environmental Management Consultants (2003). *Analyzing the Cost of Obtaining LEED Certification*. The American Chemistry Council.

Study found that LEED certification adds between 4 and 11 percent, on average, to total construction costs. This includes 'soft' costs such as design and commissioning as well as the cost for green technologies and materials.

Packard Foundation. (2002). *Building for Sustainability Report: Six Scenarios for the David and Lucile Packard Foundation Los Altos Project*. The David and Lucile Packard Foundation, Los Altos, CA, <<http://www.packard.org/index.cgi?page=building>> (Nov. 1, 2005).

This report provides a comparative life cycle cost analysis of six different scenarios representing various "shades of green" related to sustainable building. The scenarios include four levels of LEED certification, a regenerative design that greatly exceeds LEED certification, and standard construction practice. The report, along with its visually arresting accompanying comparison matrix, shows the expected cost differentials over the life cycle of the project in various ways, including first cost impacts, schedule impacts, and external costs to society.

Pearce, A.R. (2001). "Sustainable vs. Traditional Facility Projects: A Holistic Cost Management Approach to Decision Making," White paper prepared for U.S. Army Forces Command, Fort McPherson, GA, <<http://maven.gtri.gatech.edu/sfi/resources/pdf/TR/TR046.PDF>> (Nov. 1, 2005).

This paper presents a framework for comparing project alternatives holistically in terms of all costs attributable to sustainable project decisions. .

Pearce, A.R. (2002). "Sustainable Facilities: Leapfrogging the First Cost Barrier." *Construction Owners Association of America Magazine*, Summer, <<http://maven.gtri.gatech.edu/sfi/resources/pdf/TR/Leapfrog.pdf>> (Nov. 1, 2005).

This article describes strategies for surmounting the first cost barrier, along with a case study of the Homestead Air Reserve Base Fire Station.

Portland Energy Office. (1999). *Green Building Options Study: The City's Role in Promoting Resource Efficient and Healthy Building Practices*, City of Portland Office of Sustainable Development Portland, OR.

The document captures the discussions for numerous working sessions of the green building steering committee about the barriers to green buildings in Portland and the multitude of solutions for them. Results in a list of recommendations for steps the City can take to increase green building practices in city owned buildings. Provides a summary of programs around the country that existed in 1999.

Romm, J.J. and Browning, W.D. (1995). *Greening the Building and the Bottom Line: Increasing Productivity through Energy-Efficient Design*. Rocky Mountain Institute, Snowmass, CO, <<http://www.getf.org/file/toolmanager/O16F8527.pdf>> (Nov. 1, 2005).

Written by leaders in green building thinking, this report was one of the first to introduce considerations beyond first cost in making decisions with respect to

green building. The report includes case studies to illustrate the relative importance of people costs in making the decision to build green.

Solomon, N. (2005). "How is LEED Faring After Five Years in Use?" *Architectural Record*, 193(6), 135-140.

Gives a history of the evolution of LEED and a basic description of the rating categories. The article points out the following shortcomings of the LEED system: It ignores regional differences in terms of climatic conditions and resource limitations; lacks grounding in life-cycle analysis; and, is overly bureaucratic. Many of these concerns will be addressed, at least partially, in forthcoming versions of LEED.

U.S. Department of Energy. (2003). *The Business Case for Sustainable Design in Federal Facilities*. Energy Efficiency & Renewable Energy Program, Federal Energy Management Program, U.S. Department of Energy, Washington, DC, <http://www.eere.energy.gov/femp/technologies/sustainable_federalfacilities.cfm> (Nov. 1, 2005).

The Business Case provides significant financial evidence from research findings and case studies that sustainable design is a smart business choice. This document provides data and information indicating that sustainable design does not have to increase first costs and yields economic, social, and environmental benefits to building owners and society.

U.S. Green Building Council. (2003). *Building Momentum: National Trends and Prospects for High-Performance*. U.S. Green Building Council, Washington, DC, <http://www.usgbc.org/Docs/Resources/043003_hpgb_whitepaper.pdf> (Nov. 1, 2005).

This document highlights important green building components such as environmental, health, productivity and economic factors and presents recommendations for expanding green building practices in existing federal programs and policies.

U.S. Green Building Council. (2004). *Making the Business Case for High Performance Green Buildings*. U.S. Green Building Council, Washington, DC, <https://www.usgbc.org/Docs/Member_Resource_Docs/makingthebusinesscase.pdf> (Nov. 1, 2005).

This document discusses environmental impacts of the building sector, the economic and health benefits of green building, the barriers and opportunities associated with green building, and the role of the federal sector.

Wilson, A. (2005). "Making the Case for Green Building," *Environmental Building News*, 14(4), 1ff,
<<http://www.buildinggreen.com/auth/article.cfm?fileName=140401a.xml>> (Nov. 1, 2005).

This summary article provides an overview of 46 different benefits that have been identified on green building projects, in categories including first cost savings, reduced operating costs, other economic benefits, health and productivity benefits, community benefits, environmental benefits, and social benefits. Examples are provided of each benefit, and several short case studies show how these benefits were realized in actual projects.

Winter, S. (2004). *GSA LEED Cost Study*. General Services Administration, Washington, D.C.

Comparison study of varying levels of LEED certification contrasted with standard GSA practices for two different building types. Ran 6 scenarios (a high and low estimate for Certified, Silver and Gold certification levels) each for a new courthouse building and an office building modernization project. They caution against the accuracy of their estimates and the ability to generalize their findings to other building types. Their results showed that the range of cost estimates fall well below the 10% design contingency. Revised GSA budget allocations for sustainability will be between 2.5% and 4% for different projects

XENERGY Inc. and SERA Architects. (2000). *Greening City Buildings: Applying the LEED Rating System*, Portland Energy Office, Portland, OR.

The research team performed an analysis of 3 different buildings to estimate the cost differential if the buildings were to have been designed to achieve LEED certified level. While using different sets of parameters, such as designing for lowest first cost or for lowest life cycle cost they found that generally the first cost would have been higher but there would be net savings over the life cycle. One interesting aspect of this study is that it evaluated the life cycle savings for not only the building owner, but also for the City and for the larger society. While many of the benefits to society were not quantifiable they did see significant savings to the City and society. The research team concluded that the City could make their new buildings comply with LEED for little additional cost and reap financial benefits.