



Making Green Building Practices Mainstream

Introduction

The Green Building Initiative offers a path to dramatically increase adoption of environmentally preferable building construction, operation, and deconstruction practices throughout the state and the region. The term *green building*, which is essentially synonymous with *sustainable building*, will appear throughout this paper because it is a term that is already widely used to represent both these types of practices and the buildings that result. However, in occasional contexts where *sustainable building* seems more appropriate, Ecology has opted to use that term.

We have borrowed the United States Green Building Council definition of *green design* for the purpose of describing *green building* as:

Design and construction practices that significantly reduce or eliminate the negative impact of buildings on the environment and occupants in (the) five broad areas (of):

- *Sustainable site planning.*
- *Conservation of materials and resources.*
- *Energy efficiency and renewable energy.*
- *Safeguarding water and water efficiency.*
- *Indoor air quality (USGBC 2003).*

The long-term goal of this initiative is for green building to be a mainstream and usual practice throughout the state. Increased focus on green building has been identified as one of the keys to significantly reducing wastes and the use of toxic substances in our state. Aggressive action is needed to make this goal a reality. This section of the Beyond Waste Plan contains recommended actions that a committed partnership of key actors can take to make building "green" the standard practice in Washington State. Fortunately, this action agenda builds heavily on existing efforts and progress made to date in encouraging green building. Many organizations promote these practices, and a number of green building organizations have established themselves. Ecology and others in state and local government are also involved in promoting green building and the recycling and reuse of construction and demolition (C&D) wastes.

Today's green buildings vary in the degree to which they incorporate the most sustainable choices and practices into their construction and operation, but they strive to accomplish three main goals:

1. Prevent negative impacts to our environment and improve its health.
2. Reduce operation and maintenance costs for the owner and return a profit.
3. Ensure a healthy, enjoyable space for occupants to work or live.

Green buildings are energy efficient and may even generate their own energy locally. They use fresh water very efficiently and may treat and reuse water on-site. Green buildings have good indoor environmental quality, which contributes to the health, comfort and well-being of building inhabitants. They are constructed using recycled, renewable, reused, and nontoxic materials and are located near essential community services.

Background Paper for Beyond Waste Summary Document

This initiative was selected as one of the keys to moving Beyond Waste for four main reasons:

1. The amount of waste from buildings is significant. Construction and demolition waste made up approximately 34 percent of the solid waste generated in Washington in 2002 (WDOE 2003 *and* Green Solutions). This represents inefficient use of valuable resources, waste management challenges, and inefficient use of business capital. Reducing the amounts and negative effects of construction and demolition wastes will result in significant progress toward Beyond Waste.
2. Partnerships are already working on green building issues. Momentum is growing within industry and government to move toward green building practices. Tremendous successes have been achieved and green building practices are being embraced by companies and governmental jurisdictions across the country and in many areas of the globe. Focusing resources in this area has great potential to accelerate success. Examples include the following:
 - Fort Lewis, the U.S. Army installation in western Washington, has committed to building “green.”
 - Seattle, Portland, King County, and many Washington State agencies have adopted green building requirements.
 - Spokane School District 81 has committed to green design and construction for its \$130 million, 25-year building replacement and renovation program for K-12 schools throughout the City of Spokane.
3. Political support is strong. Green building is one of the key priorities for action from the Governor’s Sustainable Washington Advisory Panel. This group has been asked to lay out a sustainable path for Washington’s future that will “protect our natural wealth, strengthen our social fabric, revitalize our communities, and place our economy on a firm and enduring foundation” (Governor’s, p. 4).
4. It addresses multiple problems and yields multiple benefits. The transition to building "green" will bring many benefits to public and individual health, the economy, and the environment, as well as decrease the strain on natural resources and on the waste management system.

The design phase of a building project provides the greatest opportunity for addressing efficient use of resources and reducing waste and toxic substances. Traditional buildings consume inefficient amounts of resources, are difficult to take apart or reuse, and can contribute to health problems because of poor indoor air quality.

Finding more ways to deal with waste and reduce use of construction materials is a necessary activity. Such an effort is not, however, sufficient to create meaningful reductions in the negative environmental, social, and economic effects of conventional design and construction today. Wastes and considerable undesirable effects follow from decisions and practices at every phase of a building’s life, from inception to demolition. Therefore, an integrated approach that considers all aspects of green building are essential to ultimately make green building the standard practice.

Today's Reality

Traditional Building Impacts

The building industry has long been a strong component of Washington's economy. Since the early 1980's, the construction industry has represented about 5 percent of the gross state product in Washington. In 2000, this was \$11.3 billion of Washington's economy (USBEA).

¹ Around the world, "we will erect as many buildings in the next 50 years as we have in the last 5,000," predicts David Orr of Oberlin College (quoted in Gregory).

This vibrant industry has important benefits for our communities, but many do not recognize the negative effects that building design, construction activities and building use can have on the economy.

- Residential and commercial buildings used nearly two-thirds of all electricity consumed in the U.S. in 2003 (EIA, p. 71).
- In 1995, domestic and commercial water consumption represented 12.2 percent of all water used nationwide (USGS 1995-1, p. 18); the average person's domestic use was between 80 and 100 gallons per day (USGS 1995-2, p. 18).
- Buildings account for 60 percent of raw material (non-food and non-fuel) consumption in the U.S. (USGS 1998, p. 1).
- The Global Programs Division of the Environmental Protection Agency estimates that 60 percent of the total annual use of ozone-depleting substances in the U.S. is for building construction and building systems (cited in Cascadia and Ross, p. 6).
- Design and construction of buildings in the U.S. created 136 million tons of waste in 1996 (EPA, p. ES-2).
- C&D wastes consist mainly of wood, concrete, gypsum, roofing, glass, carpet and carpet pad, metals, asphalt, bricks, and porcelain.

In 2002, the wastes generated in Washington State and reported to be disposed of at landfills and incinerators included 835,400 tons of demolition waste (WDOE 2004-2). Undetermined volumes of C&D waste also contributed to the disposal totals reported for municipal solid waste, inert waste, and wood waste, so the demolition number by itself is lower than the full amount of C&D waste disposal. On the other hand, a reported 1,451,959 tons of concrete and asphalt, 13,825 tons of roofing shingles, 196,100 tons of wood, and 207,330 tons of other C&D materials were diverted from disposal in 2002 (WDOE 2003). The diverted materials were recycled, reused, or burned for energy recovery.

As much as 61 percent of the construction and demolition waste generated each year in Washington is diverted from disposal, which seems to exceed national rates. Construction and demolition debris consists mainly of wood, concrete, gypsum, roofing, glass, carpet and pad, metals, asphalt, bricks, and porcelain. However, a significant percentage of this diverted waste is down-cycled, or diverted to lower-value uses. For example, a primary use of salvaged wood

Background Paper for Beyond Waste Summary Document

waste is to burn it as a fuel for industrial boilers, which is a higher value use than landfilling, but is still a consumptive use. This use of wood may be less desirable than turning wood waste into finger-jointed studs or roof trusses depending on other factors such as transportation costs to factories.

In addition to total waste generation and disposal, another important waste-related environmental impact of construction is the relative hazard or toxicity of building materials. Potentially dangerous or hazardous substances in buildings include the following materials:

- Arsenic, chromium, lead, pentachlorophenol, or creosote pesticides in treated wood products.
- Asbestos, lead, mercury or other known toxic substances such as polybrominated diphenyl ethers (PBDE) flame retardants and polyvinyl chloride (PVC), as found in paints and coatings or in plumbing, fluorescent lighting, batteries, thermostats, siding, flooring, insulation, fireproofing, vinyl, plaster, wallboard, and other building materials.

The presence of hazardous materials in buildings has implications for both indoor air quality during building operation and for the potential to reuse and recycle materials at the end of a building's life. Use of building materials that contain hazardous substances also creates issues during resource extraction, manufacturing, installation, transportation, and traditional disposal.

Developments in Green Building

A growing number of states and local governments in the Northwest are adopting green building standards such as the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) Green Building Rating System™, "a voluntary, consensus-based national standard for developing high-performance, sustainable buildings." There are different versions of LEED™ for commercial construction and major renovation, existing buildings, and commercial interiors. Each version contains a checklist of credits that a building project can achieve in the following categories: sustainable site, indoor environmental quality, energy and atmosphere, water efficiency, innovation and design process, and materials and resources. Projects must achieve a certain number of credits to be certified at a variety of levels.

- At the time this report was drafted, there were five LEED™ certified commercial building projects in Washington, and 57 were awaiting LEED™ certification. Many states and municipalities—including Seattle, Clark County, and Issaquah—have adopted LEED™ green building standards for major construction and renovation projects.
- Local residential green building programs exist in King, Snohomish, Clark, and Kitsap Counties and in the cities of Seattle and Tacoma. Additionally, residential programs are under development in Spokane, Jefferson, and Thurston Counties. In Snohomish and King Counties, where green building appears to be most common, 1,753 homes have been built or remodeled and certified through the Built Green™ program since 2000 (PSAT).
- Buildings will continue to be renovated and demolished and new buildings will continue to be built. The plan of action contained in this paper provides an opportunity to continue to expand green building efforts to achieve synergistic results in reducing wastes and toxic substances.

Goals: What Washington will look like in 30 years

The impacts of traditional design and construction can adversely affect the environment in a variety of ways including: habitat destruction; energy consumption; climate change; resource depletion; waste generation; generation of toxic wastes and toxic releases; and poor indoor air quality. Significant volumes of waste are generated and many raw materials are used unnecessarily because our current design and construction practices, in large part, do not include strategies to avoid such waste.

Much more aggressive action and collaboration are needed, especially among the design, construction, and recycling industries, and various government entities, to achieve and sustain a future that is Beyond Waste.

The following are the 30-year goals for the Green Building Initiative:

■ **Green Building Practices Are Mainstream**

Green building practices and the demand for green homes and buildings is the norm in the Pacific Northwest, due in part to Washington State's leadership. Nearly 100 percent of all renovations and new construction adhere to the highest standards of green building.

■ **Reuse of Buildings and Recycling of Construction Materials Are Normal Business Practices**

Adapting and reusing existing buildings is a higher priority than dismantling and recycling their components. Materials are safely recycled into high-value products. Recycled and reusable building materials are commonplace and sold through all mainstream building material supply businesses. A network of businesses thrives on reusing and recycling building materials.

■ **Buildings and Materials Are Designed for Human, Economic and Environmental Health**

The design of buildings and construction materials has been transformed, and water and energy needs for buildings are met on-site. These buildings operate pollution free, generate no waste, and promote the health and well-being of all inhabitants. Toxic components have been phased out of building materials or recaptured for recycling, and materials are designed to be safely recycled or reused at the end of their life.

Benefits of Green Building

In the future, when Washington has moved "beyond waste" with the built environment and the goals listed above are met, negative health impacts such as poor indoor air quality will be minimal. The building industry and related trades will thrive, and Washington's buildings will contribute to a desirably high quality of life. Creating this future will require significant, long-term transformations in building practices.

Green construction has demonstrated tangible benefits for building owners and tenants, the environment, individual and public health, and local and regional economies. For owners, the benefits come in lower energy, maintenance, and operations costs. For tenants, better indoor air quality joins energy savings as a major benefit. The improved indoor air quality translates to fewer sick days from employees and better worker satisfaction and productivity. In retail environments, improved daylight also can translate to higher sales. For residents, green-built homes provide similar benefits.

Background Paper for Beyond Waste Summary Document

For the environment, green building means less soil disturbance and less reduction in stormwater management capacity. Applying green building principles can reduce the emission of greenhouse gases from buildings and the heat island effect created by concentrations of impervious surfaces. The use of green building materials decreases the need to harvest virgin resources to create new buildings, and helps to make use of materials that might otherwise become wastes. In addition, adherence to green building principles encourages the renovation and reuse of existing building stock, thus reducing urban sprawl.

For local and regional economies, green building can encourage a renaissance of deteriorating urban cores, and it can stimulate markets for urban housing and for non-toxic and environmentally sensitive construction materials and finishes. On the residential side, green building has been able to demonstrate a market niche of its own in some locations as chemically sensitive and environmentally conscious consumers gravitate toward sustainably constructed green homes and apartments.

Achieving the Beyond Waste vision for the built environment—where all buildings are designed and built green, disposal of construction and demolition debris is minimized, and building materials are sustainable and nontoxic—will require significant, long-term changes in building practices. These transitions will not be easy or quick, but they have the potential to provide significant environmental, human health, and economic benefits for the people of Washington State. Fortunately, green building is already a movement within the building industry that is gaining momentum daily.

The Action Plan

Shorter-Term Milestones

This initiative includes recommendations in several areas that, together, should yield significant advances in green building throughout the state. To reach the thirty-year goals described above, we must make considerable progress in the short term. The following are milestones for the first five years of the Green Building Initiative.

- ✓ Washington State is a national leader in green building.
- ✓ All new state government buildings meet green building standards.
- ✓ Some economic incentives are in place and in use, and government has removed at least one major regulatory barrier to green building.
- ✓ Expansion of the reuse and recycling infrastructure is underway, and at least two additional facilities in underserved areas are in operation.
- ✓ Through increasing awareness of the benefits of green building the use of reused and/or recycled building materials has increased by at least 25 percent, and these materials are widely available.
- ✓ Ten percent of new residential and commercial construction use green building practices.
- ✓ The curricula for all accredited architectural programs in the state incorporate green building design.

- ✓ Ongoing industry-specific short courses are available across the state.
- ✓ More than 90 percent of people working in building and building-related sectors in Washington State are familiar with green building practices and are aware of the availability of green building resources (training, technical assistance, etc).
- ✓ Product stewardship programs for carpet, paint, and mercury-containing building products are in place.
- ✓ All building material manufacturers are aware of what extended producer responsibility means.

Overview of Proposed Strategies

Seven action recommendations are proposed here as the most important starting points for moving the Green Building Initiative agenda forward toward the 30-year goals. The recommendations build on the momentum of existing green building efforts and contribute to economic development. They also use the leverage of government procurement and regulation to drive change and build public awareness so that progress can occur more quickly.

Probably the most important facet of this key initiative is the plan to facilitate and coordinate partnerships that can carry out the priority actions and ensure their success. Government, business, community groups, and individuals all have a vital role to play in achieving successful implementation of the recommendations presented in this action plan.

The proposed action agenda should support the goals of participating organizations as well as the Beyond Waste goals.

Summary List of Recommendations

The seven priority action recommendations are on the list below, and more detailed explanations of each of them follow.

Recommendation GB1	Coordinate and facilitate partnerships to implement the green building action plan
Recommendation GB2	Lead by example in state government
Recommendation GB3	Provide incentives that encourage green design, construction, and deconstruction and begin removing disincentives
Recommendation GB4	Expand capacity and markets for reusing and recycling construction and demolition materials
Recommendation GB5	Provide and promote statewide residential green building programs
Recommendation GB6	Increase awareness, knowledge, and access to green building resources
Recommendation GB7	Encourage innovative product design

Priority Recommendations

Recommendation GB1 — Coordinate and facilitate partnerships to implement the green building action plan

Statement of Action

Establish a lead organization to promote these efforts and to coordinate their statewide implementation.. Ecology can serve in this capacity unless another organization would be better able to do so. This effort includes working with partners to develop cost-effective programs, tools, and techniques to encourage green building.

Specific Steps

- ✓ Consult, communicate and collaborate with key partners to promote coordinated implementation of the Green Building Initiative.
- ✓ Establish a lead organization to coordinate, facilitate and track the Green Building Initiative.
- ✓ Work with partners to develop cost-effective programs, tools, and techniques to encourage green building.
- ✓ Collect and analyze data to measure and communicate progress. Share information widely and serve as an information resource.

Background/Rationale

The Green Building Initiative is broad and requires cooperation among and commitment from many participants. Several organizations, businesses, and governmental entities are already engaged, at least to some extent, in some of the actions recommended here. Ecology will bring together partners and will facilitate collaboration among the numerous organizations working on green building. To make adequate progress toward the thirty-year goal of green building becoming mainstream throughout Washington State, action must be strategic and prioritized. Many of the recommendations are interconnected and must be pursued concurrently. Additionally, tracking and communicating progress is a particularly important function. For the time being, Ecology will serve in this capacity and will bring together key partners to help guide implementation of the green building action agenda.

While Ecology can provide significant support and coordination for advancing this green building action agenda, the leadership of the multitude of green building organizations and actors currently working throughout the state will continue to be central to meeting both the short-term and the long-range goals of this initiative.

We will need to thoroughly document any efforts to promote more sustainable building so that we can replicate success, avoid failure in the future, and assess progress. Initially, evaluation should focus upon establishing a baseline against which we can measure future progress. Without such a baseline, communicating progress to stakeholders, potential funding agencies, and other partners will be difficult. Specific indicators for green building are proposed as part of the overall set of Beyond Waste performance measures.

The green building success measures are:

- The fraction of new buildings that meet adopted standards such as LEED™ or Built Green™.
- The number of building codes that include green building elements.
- Additional indicators that we might use to establish baselines and then to track over time include:
 1. Tracking visitors to the green building Web sites, requests for and provision of technical assistance, surveys of clients of green building programs to determine satisfaction levels, and the role of the program in influencing their building decisions.
 2. Survey customers at retailers to determine their knowledge of and demand for “green building.” Repeat over time. Survey building managers to determine their knowledge of and demand for “green building.” Survey owners of green buildings to determine what influenced their decision to buy a “green building.” Survey suppliers to determine if there is a measurable shift from demand for and purchase of more sustainable building materials.

Recommendation GB2 — Lead by example in state government

Statement of Action

State government needs to lead by example to promote green building. Build or renovate all state-funded buildings to LEED™ standards, or equivalent standards, for projects entering into pre-design in the 2005-07 biennium and after. Adapt state government procurement processes to ensure green building materials are purchased.

Specific Steps

- ✓ Adopt a policy requiring all state-funded buildings to be constructed using LEED™ standards, the Washington Sustainable Schools (WSS) standards, or equivalent standards.
- ✓ Advance green building practices throughout state government for all types of projects by developing and providing education, technical assistance, information/technology exchanges, and training, and also through enhancements to the project delivery process.
- ✓ Institute an ongoing monitoring and recognition program by July 2006 to track progress and to recognize outstanding green building performance and best practices in state government.
- ✓ Institute standards and a program for ensuring purchase of environmentally preferable building materials. The most effective means for achieving this will need to be assessed, but will involve one or more of the following: procurement guidelines, state contracts, project manuals, model specifications, education, or other techniques.
- ✓ Promote adoption of green building standards and purchase of environmentally preferable building materials to local governments and the private sector.
- ✓ Participate in established processes to ensure that green building standards continuously improve as new technologies and issues emerge, and to address concerns that are raised.

Background/Rationale

When compared to their traditional counterparts, buildings built to LEED™ standards have lower energy and water bills, require lower maintenance costs, and improve employee productivity

Background Paper for Beyond Waste Summary Document

(Morton). Given the LEED™ criteria for Materials and Resources, it seems reasonable to assume that projects that meet some or all of these criteria move much closer to the Beyond Waste vision than projects that do not.

Despite the sometimes higher initial costs, green buildings save money over time. A recent California study analyzed 33 buildings constructed to some level of LEED™ standard and compared them in terms of initial costs and operating costs to 100 buildings of comparable size and use constructed to traditional standards. The result was that those built to LEED™ silver had a 2% cost premium for initial design and construction, but a 20% improvement in operating performance. They paid back the initial investment in green design features 10 times over in a short period of time. <http://www.ciwmb.ca.gov/GreenBuilding/Design/CostBenefit/ExecSummary.pdf>

A growing number of states and local governments in the northwest are adopting green building standards such as the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED™). The Governor's Sustainable Washington Advisory Panel and the Washington State Joint Legislative Task Force on Green Building both have recommended that Washington State adopt LEED™ or some equivalent standard. Many agencies, including Department of General Administration, Department of Corrections, Parks and Recreation, and Department of Social and Health Services have included building to LEED™ standards in their sustainability plans required by Executive Order 02-03, *Sustainable Practices by State Agencies* (Locke). This recommendation is consistent with and helps to further these existing efforts.

These activities should help to spread green building practices well beyond state government. Because the state government constructs so many buildings (\$2.5 billion in new construction for the 2003-05 biennium [OFM]), its purchasing decisions represent a very effective leverage point. These actions will encourage a market for green building practices and materials, and provide a very strong incentive for those that value the state's business to master green building practices and techniques. This educational process builds additional capacity within the building industry for creating green buildings thus overcoming traditions, perceptions and lack of awareness, tradition, and perception.

Also, the public uses state government buildings a great deal, so these actions throughout state government will go a long way toward raising awareness of green building practices among the general public, thereby corroding the lack-of-awareness barrier. With additional education on this topic, members of the public may begin asking for green buildings, thus creating additional demand.

The Washington State Department of General Administration will lead this effort, in collaboration with the following state government agencies and entities: Office of Financial Management, Department of Ecology, Office of the Superintendent of Public Instruction, Department of Corrections, Department of Social and Health Services, Community and Technical Colleges, Higher Education Coordinating Board, the University of Washington, Washington State University, and others. We will request assistance from green building partner organizations in promoting these practices outside of state government.

Recommendation GB3 — Provide incentives that encourage green design, construction, and deconstruction and begin removing disincentives

Statement of Action

Provide incentives that encourage green design, construction, and deconstruction practices. Research, assess, and begin instituting incentives that will increase green building demand and participation. Also, identify and begin to remove regulatory barriers and other disincentives that serve to discourage green building practices. Encourage the lending industry to embrace green building. Additional assessment is needed to develop specific incentives that will be highly effective in expanding green building practices. This will involve considering several different types of incentives, including various economic incentives as well as permitting and regulatory incentives. It is important to recognize that different areas and circumstances call for different types of incentives to be offered.

Once regulatory and other barriers are clearly identified, a strategy for building support to remove the ones that most significantly discourage green building practices will be developed. The new provisions should encourage, rather than simply accommodate, green building practices. Provisions that prohibit—or seem to prohibit—green building practices may be found in reviews of the State Building Code, local building codes, and other applicable state regulations, specifically including those related to land use, zoning, stormwater management, water resources, and shoreline protection.

Specific Steps

- ✓ Survey architects, contractors and others statewide to learn of specific regulatory barriers and disincentives to green building and also to learn about potential incentives that would be most effective.
- ✓ Develop a strategy to remove the most significant barriers and disincentives where market forces have not remedied the problem. This will likely require action by the state legislature and will likely involve local regulation changes, including zoning and land use laws. Work with local entities to inform, build support for, and assist with making these changes.
- ✓ Identify and promote existing incentives that can be used to increase green building practices.
- ✓ Evaluate potential economic incentives for private sector entities, including energy incentives and tax incentives.
- ✓ Evaluate potential economic incentives for public sector entities, including grants, loans, and other funding for local jurisdictions to implement green building programs, and also density bonuses (higher-density buildings when green building standards are met) or other incentives to individual building and housing owners.
- ✓ Work with and provide assistance to local jurisdictions to prioritize reuse and recycling of buildings and construction and demolition waste through local solid waste plans.
- ✓ Assess the viability of recognition programs, other promotional programs, and preferential permit processing as incentives for increasing green building practices.
- ✓ Evaluate other potential incentives, including all types of insurance rates for building owners, homeowners, and employers.
- ✓ Develop a package of incentives and a plan for instituting and marketing them.

Background/Rationale

Green building practices and materials can cost more initially because they may involve more time-intensive processes and there may be a lack of knowledge by owners, architects, and contractors. In particular, costs increase when green elements are shoehorned into a traditional building process. Builders are reluctant to use anything they think may cost more.

A wide variety of people have agreed on the need for economic and other incentives to advance green building by making it more accessible and more affordable. Changing codes and regulations to favor green building practices will alter the playing field and help to make building green a standard practice. Providing incentives and removing disincentives addresses important barriers to green building: lack of awareness, perception of higher cost, and the traditional nature of the building industry.

Despite the sometimes higher initial costs, green buildings save money over time. Green buildings often deliver their largest paybacks months or years after a project is occupied. The occupant of the building, not the designer or contractor, receives the benefits derived from a more energy-efficient building that houses healthier and more productive workers. Incentives offered to those who do not directly benefit from the long-term savings of green buildings will encourage more widespread implementation and acceptance. Ecology should sponsor research into methods and opportunities to move some of the financial benefit received downstream by owners back in the process to a point where the designers and contractors can recover some portion of it as an incentive to design and build green.

Ecology should conduct some preliminary research on possible incentives and existing disincentives. Practitioners in the building and building-related industries should be surveyed to learn about effective incentives, barriers, and disincentives to green building. The next step will be to work with partners to evaluate and develop a package of potential incentives for use as appropriate in various areas. Some of the incentives might require authorization from the state legislature and/or others.

Tax credits, low-interest financing, discounts, grants, and rebates are examples of economic incentives that we should consider and/or that other areas are successfully using. An example is the 5-7 percent green building tax credit for multi-residential and commercial buildings in New York (NYSDEC). Maryland has a similar program (MEA). Utility companies already award energy credits to building owners who can demonstrate, through modeling, that their designs will save energy. For instance, Seattle City Light and Seattle Public Utilities offer a competitive incentive program for multi-family residences that offers funding for many projects meeting Built Green™ certification (Seattle). These programs can and should be expanded and marketed more thoroughly. The same approach might be adopted for fees to employers in these buildings. If the buildings are safer and healthier places to work, discounted Department of Labor and Industries assessments on those employers should financially recognize this benefit to all of the taxpayers of the state. Examples of additional potential incentives include, but are not limited to, monetary awards, public recognition at community events, scholarships to sustainable design trainings, and educational programs.

A lack of information about and acceptance of some green building technologies by those who regulate and certify construction can create significant barriers to widespread use of these technologies. In other cases, mortgage lenders unfamiliar with alternative building systems such as straw-bale will decline construction loan applications, even though many successful straw-bale buildings are providing everything from housing to office and library space in locations throughout Washington State. If the building codes specified straw-bale construction, then lenders would undoubtedly be more likely to finance this type of construction.

Some local building codes do not address the use of green materials and technologies. This requires a building permit applicant to document and prove technologies or practices, an effort that can be costly. This situation is a significant barrier, because either the architect or the contractor must take the time to explain the material or technology, provide engineering drawings, or otherwise convince the building code officials that the material or technology is safe to use.

Recommendation GB4 — Expand capacity and markets for reusing and recycling construction and demolition materials

Statement of Action

Identify places where additional capacity is needed for the reuse and recycling of building materials, and begin planning to provide it. Current needs include increased processing capacity in eastern Washington, additional transfer stations and sites to receive construction and demolition materials, increased storage/retail capacity for reusing materials, increased recycling services in urban areas, and more facilities that can process demolition materials containing toxic materials. Within five years, expansion of the reuse/recycling infrastructure will be underway, and at least two additional facilities in underserved areas will be in operation. The use of reused and/or recycled building materials will increase by at least 25 percent within five years. Assess current markets and develop a plan to expand market capacity to manage the materials.

Specific Steps

- ✓ Survey builder associations, local government officials, and others regarding areas where a lack of facilities is an impediment to reuse and recycling. Develop a mapped database of building materials and recycling facilities for analyzing needs and opportunities.
- ✓ Develop and implement a strategy for developing additional processing capacity where needed in Washington. This proposal may include providing financial incentives, including grants, loans, tax credits, or other financing mechanisms.
- ✓ Facilitate the development of pilot projects and case studies to help determine the viability of, and needed conditions for, the deconstruction and recycling of existing buildings as an alternative to demolition and disposal. Site at least two facilities in underserved areas.
- ✓ Consider possible future bans on the disposal of construction and demolition materials and begin planning for that eventuality.
- ✓ Assess current markets and develop a plan to expand market capacity to manage the materials.
- ✓ Work with local jurisdictions to incorporate provisions into local solid waste plans that promote reuse and recycling of building materials, and then plan for adequate processing infrastructure to handle the materials.

Background/Rationale

State and local governments must work together with the private sector to improve the economics of green building by changing policies, providing incentives, and increasing the infrastructure available for recycling and processing building materials. Many experts have stated that the best way to increase recycling of construction and demolition debris in rural and underserved areas is to provide processing services, particularly for concrete and gypsum. An intelligently designed reuse and recycling infrastructure for building materials would be an economic development asset. This is especially true in many Eastern and Central Washington counties where distance to recycling and reuse facilities is an impediment to the development of a deconstruction industry or the integration of some building materials into organics recycling operations. Currently, there are no processors of these materials in rural areas, so builders must ship materials to Seattle, Portland, or other distant locations. Concrete and gypsum are very heavy, high-volume wastes, so transportation costs are prohibitive, and as a result, the materials end up in landfills. In addition, many materials contain toxic substances and few facilities can process them, so these materials often end up in landfills too.

Expanding the processing infrastructure will necessitate deliberate and innovative action, due to existing market conditions. Ecology should conduct the survey work with partners to evaluate and develop proposals. While developing additional processing capacity is a long-term venture, siting at least two facilities in underserved areas within the next five years would enhance the likelihood of widespread support for this effort.

Recommendation GB5 — Provide and promote statewide residential green building programs

Statement of Action

Work with leaders of existing residential green building programs to make the programs available throughout the state for local implementation. Provide and market available support, including but not limited to technical assistance, promotional materials and checklists.

Specific Steps

- ✓ Work with leaders of existing residential green building programs to develop plans for statewide expansion.
- ✓ Provide and market available support, including but not limited to technical assistance, promotional materials, and checklists.

Background/Rationale

Several local governments in Washington State have developed green building programs for residential construction and renovation. The Built Green™ program of the Master Builders Association of King and Snohomish Counties, the BUILT GREEN/Build a Better Kitsap program of Kitsap County, and the Build a Better Clark program of Clark County all have self-certification programs for green residential construction. These local green building certification programs are similar to the LEED™ program in that they too incorporate checklists of criteria that provide a guide to builders and owners on how to construct green buildings and renovate or construct single-family homes using green building practices.

As with the LEED™ standards for commercial buildings, it is not possible to discern quantitatively just how “sustainable” homes built according to Built Green™ or similar standards truly are. However, given that the criteria emphasize goals similar to the Beyond Waste vision, we assume that the use of Built Green™ standards does help move Washington State toward the Beyond Waste vision. Efforts should be made, though, to advance the statewide program toward increasingly more sustainable outcomes.

Ecology will work with existing program leaders to identify how to build on their success and invite partners in local governments and industry associations, such as the Master Builders Association or the National Association of Home Builders, to help develop the program and generate support. This partnership will develop a strategy to provide residential green building program support such as assistance to local program providers, technical assistance to those attempting to build to standard, and support materials.

Recommendation GB6 — Increase awareness, knowledge and access to green building resources

Statement of Action

To maximize success, people must be aware of and aligned with the green building goals. This action calls for promoting the expansion of green building practices statewide through raising awareness and teaching green design and green building.

Specific Steps

- ✓ Develop and implement an ongoing, coordinated, effective marketing effort aimed at general consumers and also at the building-related professions.
- ✓ Develop a comprehensive, user-friendly clearinghouse of information for Washington. This could take the form of a Web site.
- ✓ Support expansion of educational programs that non-profit, private, and government sectors are already providing.
- ✓ Develop and conduct industry-specific short-courses and seminars on specific green building techniques, strategies, and materials.
- ✓ Assess the need for a green builder or a green subcontractor certification program, and begin development of such a program, if appropriate.
- ✓ Work with universities, community colleges, trade schools, and apprenticeship programs to develop a plan for including green building practices in curricula.
- ✓ Promote establishment of staffed technical-assistance centers for sustainable design and construction.
- ✓ Promote regional businesses that provide and use green building practices and materials.

Background/Rationale

Many of the experts interviewed stated that the most important change needed to transform the building industry is for owners and developers of buildings to demand green building practices. Because many building owners are not aware of green building concepts and benefits, they do not ask for “green buildings,” and therefore the building industry does not

provide them. This recommendation focuses on development of strategies to increase awareness of green building for two primary audiences: the design and construction industry, and consumers.

The goal of the industry awareness effort is to increase interest in learning how to implement green building strategies by offering educational opportunities. The process of green building is fundamentally different than that of traditional building, so training programs for present and future design and construction industry professions are necessary to increase acceptance of green building practices. Content for these programs will be tailored to suit targeted audiences and delivered through various partnership efforts. Potential audiences include architects, builders, production home developers, trades people, deconstructors, lenders, local planners, recyclers, realtors, manufacturers and suppliers. The creation of a centralized, comprehensive Web site featuring preferable material choices, technical briefs, and case studies will provide additional educational resources, and help eliminate some of the frustration experienced by many industry professionals encountering overwhelming amounts of conflicting recommendations when searching for green building information.

The goal of the consumer awareness effort is to increase demand for green homes and green buildings by successfully conveying the associated health and cost benefits. Marketing efforts will highlight the lower operating costs, increased worker productivity, customer interest, and student achievement that comes with improved indoor air quality and day lighting associated with green homes and office buildings. The Web site will provide consumers with easy access to green building information.

Recommendation GB7 — Encourage innovative product design

Statement of Action

Work with partners to achieve manufacturer commitment to innovative product design and life-cycle management. Focus first on product stewardship programs for carpet, paint, and mercury-containing building products and then develop criteria to identify additional products of concern for future product design efforts, such as those that contain polyvinyl chloride (PVC) or polybrominated diphenyl ethers (PBDE) flame-retardants.

Specific Steps

- ✓ Support and actively participate in regional and national product stewardship councils and efforts to help ensure that current product stewardship initiatives for building materials are making progress.
- ✓ Work with product stewardship advisory groups to develop criteria for selection of the next phase of building products, with emphasis on products with hazardous contents.
- ✓ Support and actively participate in efforts to increase the availability of green building materials that consumers can feel confident in using.

Background/Rationale

Waste and pollution result throughout the process of product development—during raw materials extraction, transportation, manufacturing, and product use. While pollution generation may be unintended, the results are costly—to the environment, society, and our

economy. These costs are borne by the public in general in the form of taxes for disposal, cleanup of failed disposal facilities and increased health costs due to exposure.

The transformation to the Beyond Waste vision will require thoughtful product design and a materials management system that keeps materials in continuous closed-loops within our economy. Voluntary product stewardship programs are underway or have been tried in Washington State through regional and national alliances for both carpet and paint. The Northwest Product Stewardship Council defines product stewardship as follows:

“Product Stewardship is an environmental management strategy that means whoever designs, produces, sells, or uses a product takes responsibility for minimizing the product’s environmental impact throughout all stages of the product’s life cycle. The greatest responsibility lies with whoever has the most ability to affect the lifecycle environmental impacts of the product” (NWPSC).

This action recommendation will build on current efforts to work with manufacturers to achieve commitment to more innovative product design and lifecycle management. Within five years, programs for carpet, paint, and mercury-containing building products need to be in place.

The longer-term goal is for manufacturers to consider the full lifecycle of buildings and materials during the design process so that they result in less waste, are free of toxic substances, contain recycled materials, do not contribute to poor indoor air quality, are designed for flexibility, and are easy to recycle or reuse through a carefully designed materials management system. This new system can virtually eliminate the adverse impacts that the current system has on our economy, the environment, and our quality of life.

Future Recommendations

In five years, an evaluation should be conducted to assess the progress made toward expanding the green built environment in Washington. The next phase of implementation for the green building action agenda should then be developed. As part of that assessment, the additional recommended actions listed below should be considered and included, as appropriate, to make further progress toward the thirty-year goals. Most of these additional recommendations represent continuations of efforts that have already begun or that will be started within the next five years as part of the actions proposed above.

Support Continued Updating and Expansion of Design and Construction Standards

Continually improve the standards that serve as benchmarks for sustainability in design and construction and encourage their use by a broader audience.

- ✓ Work with the U.S. Green Building Council and others to ensure that LEED™ standards and other adopted standards continue to accommodate and incorporate new technologies and practices, including those that more directly address toxicity in building materials.
- ✓ Promote the use of LEED™ and other design standards in private and public construction projects. Provide assistance to designers or builders attempting to implement these programs.
- ✓ Support the development of generally accepted industry definitions of green building materials.

Background Paper for Beyond Waste Summary Document

- ✓ Work with the building industry and permitting agencies to identify ways to help green building projects through the permitting process.

Further Expand Infrastructure to Support Additional Reuse, Recycling and Deconstruction

- ✓ Continue to attract investment and work with the recycling industry and the economic development agencies to develop processing capacity in rural or underserved areas.
- ✓ Continue to implement pilot projects to demonstrate the deconstruction, reuse, and recycling of existing buildings as an alternative to demolition and disposal.
- ✓ Support and help secure funding for the development of regional reuse and recycling facilities throughout the state.
- ✓ Phase out disposal in municipal solid waste landfills where adequate capacity for reuse and recycling of construction and demolition debris has been established.

Develop Green Products and Product Stewardship Initiatives

The goal of the following activities is to transform the design of building materials so that they generate less waste, use no toxic substances, are easy to disassemble and recycle at the end of their useful lives, and are procured through sustainable methods.

- ✓ Support development of regional manufacturers and suppliers of green building materials.
- ✓ Work with Department of Natural Resources and private timberland owners to increase the percentage of sustainably managed and certified forests in Washington State.

Support Research and Development

Develop and gain support for a proposal that will include:

- ✓ Original research into new materials, design strategies, and building systems that promote a more sustainable building industry.
- ✓ Development of new, cost-effective, and environmentally sensitive methods for reusing and recycling building materials.
- ✓ Testing of green building materials to help overcome resistance to incorporating these new, environmentally benign materials.

Develop Additional Performance Measures

In addition, shorter-term and/or more specific indicators will be developed to measure progress on specific actions. These may include the following:

- ✓ Tracking the numbers of state buildings constructed or renovated to adopted green building standards over time; the amount of waste reduced and diverted through state construction projects; energy and water savings that accrue from these buildings; the reduction in other operating costs (such as landscape maintenance); and changes in the state's purchasing of environmentally responsible building materials.
- ✓ Comparing the designs of the chosen materials before and after product design to determine changes in the use of toxic and recycled materials, and design for disassembly.
- ✓ Tracking the numbers of visitors to the green building Web sites, tracking requests for and provision of technical assistance, and surveying clients of green building programs to determine satisfaction levels and the role of the program in influencing their building decisions.

- ✓ Surveying customers at retail suppliers to determine their knowledge of and demand for green building. Repeat over time. Surveying building managers to determine their knowledge of and demand for green building. Surveying owners of green buildings to determine what influenced their decision to buy a green building. Surveying suppliers to determine if there is a measurable shift in demand for and purchase of more sustainable building materials.

Conclusion

The Beyond Waste Green Building Initiative consists of a long-term strategy to help the building industry to fundamentally transform itself from current practices to a new more sustainable way of doing business. This initiative will build on the good work of and the collaboration among all sectors and customers involved in the building industry including developers, architects, engineers, contractors, trades people, lenders, property owners, appraisers, material designers and suppliers, waste management companies, and regulatory officials.

A variety of approaches will be needed to make this transformation successful, including government leading the way with required green building standards for state buildings and purchase requirements for environmentally preferable building materials. Also, improving the infrastructure and capacity for reusing and recycling building and construction materials is an essential component of this initiative. It is important to also transform the design of buildings and building materials so they generate less waste, incorporate no toxic substances, and are able to be disassembled and recycled at the end of their useful lives.

While this is an aggressive initiative, progress in reducing waste and reusing materials will also yield significant benefits in energy, water, air, and land issues. Equally important are the tremendous benefits to Washington State's economy and the increased well-being and quality of life that Washington's people can enjoy as buildings become healthier and safer for everyone.

Implementation Plan for the Green Building Initiative

The following table shows when the recommendations from this initiative will be undertaken. This table is an excerpt from the Beyond Waste Implementation Plan, which can be accessed at <http://www.ecy.wa.gov/biblio/0407034.html>

Background Paper for Beyond Waste Summary Document

Making Green Building Practices Mainstream

Recommendations to Begin in First Year	Approach for Implementation	Recommendations for Years 2-5
<p>GB1 Coordinate and facilitate partnerships to implement the green building action plan</p> <ul style="list-style-type: none"> Convene partnership forum to coordinate implementation of GB initiative. 	<p>Ecology will lead or coordinate these efforts.</p>	<p>GB3. (Remainder) Develop strategy to address disincentives and to employ incentives</p>
<p>GB2 Lead by example in State government</p> <ul style="list-style-type: none"> Assistance to state government to use green building practices, including procurement of environmentally preferable building materials; technical assistance and training. Recommendations to legislature to identify incentives that will increase state government green building investments. 	<p>Ecology will lead this effort at first, in close cooperation with GA, OFM and other entities and will seek others to lead green building-related efforts. Ecology will lead these efforts in consultation with affected parties.</p>	<p>GB4. Expand capacity and markets for reusing and recycling construction and demolition materials.</p>
<p>GB3 Provide incentives that encourage green design, construction, and deconstruction</p> <ul style="list-style-type: none"> Research regulatory and other disincentives that act as barriers Identify and promote existing incentives Survey stakeholders for input on incentives and regulatory barriers 	<p>Ecology will lead these efforts in consultation with affected parties.</p>	<p>GB6. (Remainder) Info clearinghouse, technical assistance centers, marketing</p>
<p>GB5 Provide and promote statewide residential green building programs</p> <ul style="list-style-type: none"> Market available support, such as technical assistance, promotional materials, and checklists. Create a BuiltGreen Washington Web site; cookbook on how to start new programs; market available resources and technical assistance. 	<p>Ecology will lead this effort with other entities.</p>	
<p>GB6 Increase awareness, knowledge and access to green building resources</p> <ul style="list-style-type: none"> Support expansion of educational programs that nonprofit, private, and government sectors are already providing; Work with educational institutions at all levels to develop a plan for including GB practices in curricula. 	<p>Ecology will lead these efforts and will seek others to lead green building-related efforts.</p>	
<p>GB7 Encourage innovative product design</p> <ul style="list-style-type: none"> Support and actively participate in regional and national product stewardship councils and efforts to help ensure that current product stewardship initiatives for carpet, paint, and mercury-containing building products are making progress. Use government purchasing power to drive product stewardship efforts. 	<p>Ecology will lead this effort at first, in close consultation with regional and national product stewardship councils and research universities.</p>	

Bibliography

- Cascadia Consulting Group and Ross & Associates (2003). *Expanding Green Building Practices in Washington State*. Washington State Department of Ecology Publication 03-07-028. Available at <<http://www.ecy.wa.gov/pubs/0307029.pdf>> accessed 5/9/04.
- City of Seattle (Seattle), "2003 Built Green™ Incentive Program." Available at <http://www.cityofseattle.net/sustainablebuilding/incentives/docs/Seattle_BUILT_GREEN_Incentive_2003.pdf> accessed 5/7/04.
- Energy Information Administration (EIA). *Electric Power Monthly*. United States Department of Energy. March 2004. DOE/EIA-0226 (2004/03). Available at <<http://www.eia.doe.gov/cneaf/electricity/epm/epm.pdf>> accessed 5/6/04.
- Governor's Sustainable Washington Advisory Panel. *A New Path Forward: Action Plan for Sustainable Washington*. February 2003. Available at <http://sustainableseattle.org/sustpanel/ANewPathForwardActionPlan.pdf>> accessed 5/9/04.
- Green Solutions. *Waste Composition Analysis for the State of Washington*. Unpublished report. Washington State Department of Ecology, June 2003.
- Gregory, Bert. "The Future Bodes Well for Green Development." *Seattle Daily Journal of Commerce*. May 2, 2002.. Online edition, available at <http://www.djc.com/news/en/11132992.html>, accessed May 6, 2004.
- Locke, Governor Gary (2002). "Executive Order 02-03: Sustainable Practices By State Agencies." Available at <www.governor.wa.gov/eo/exorders.htm> accessed 5/9/04.
- Maryland Energy Administration (MEA). "Green Building Tax Credit." Available at <http://www.energy.state.md.us/programs/commercial/greenbuilding/greenbuilding_faq.pdf> accessed 5/7/04.
- Morton, Steven. "Business Case for Green Design." *Building Operating Management*, November 2002.. Available at <<http://www.facilitiesnet.com/bom/Nov02/Nov02environment.shtml>> accessed 5/7/04.
- New York State Department of Environmental Conservation (NYSDEC). "Applications Available for Building Tax Credits." (Press release.) Available at <http://www.dec.state.ny.us/website/press/pressrel/2002x147.html>> accessed 5/7/04.
- Northwest Product Stewardship Council (NWPSC). "What is Product Stewardship?" Available at <<http://www.productstewardship.net/>> accessed 5/7/04.
- Office of Financial Management (OFM). "2003-05 Budget Overview." Available at <<http://www.ofm.wa.gov/budget03/overview/overview.pdf>> accessed 5/7/04.

Background Paper for Beyond Waste Summary Document

Office of the Superintendent of Public Instruction (OSPI). "Washington Sustainable Schools (WSS)." Available at <<http://www.k12.wa.us/schfacilities/sustainableschools.aspx>> accessed 5/6/04.

Puget Sound Action Team (PSAT). "Green Building Programs." Available at <http://www.psat.wa.gov/Publications/LID_studies/green_building.htm> accessed 5/7/04.

Resource Venture. "Sustainable Building." Available at <<http://www.resourceventure.org/rv/issues/building/introduction/index.php>> accessed 5/9/04.

U.S. Bureau of Economic Analysis (USBEA). Gross State Product Data, 6/10/02. Available at <<http://www.bea.doc.gov/bea/regional/gsp>>, accessed 5/7/04.

United States Environmental Protection Agency (EPA), *Characterization of Building-Related Construction and Demolition Debris in the United States*. May 1998. EPA530-R-98-010. Available at <<http://www.epa.gov/epaoswer/hazwaste/sqg/c&d-rpt.pdf>> accessed 5/6/04.

United States Geological Survey (USGS 1995-1). *Estimated Use of Water in the United States in 1995*. "Offstream Use." Available at <<http://water.usgs.gov/watuse/pdf1995/pdf/summary.pdf>> accessed 5/6/04.

United States Geological Survey (USGS 1995-2). *Estimated Use of Water in the United States in 1995*. "Domestic Use." Available at <<http://water.usgs.gov/watuse/pdf1995/pdf/domestic.pdf>> accessed 5/6/04.

United States Geological Survey (USGS 1998), "Materials Flow and Sustainability" (fact sheet). June 1998. Available at <<http://pubs.usgs.gov/fs/fs-0068-98/fs-0068-98.pdf>> accessed 5/6/04.

United States Green Building Council (USGBC 2003). "An Introduction to the U. S. Green Building Council and the LEED™ Green Building Rating System." April 2003. Available at <http://www.usgbc.org/Docs/usgbc_intro.ppt> accessed 5/7/04.

Washington State Department of Ecology (WDOE 2003). *Solid Waste in Washington State, Twelfth Annual Status Report*. Lacey, WA: Washington State Department of Ecology Solid Waste and Financial Assistance Program, 2003. Available at <<http://www.ecy.wa.gov/pubs/0307019.pdf>> accessed 5/7/04.

Washington State Department of Ecology (WDOE 2004-1). "Demolition Debris Resources." Updated 1/28/04. Available at <<http://www.ecy.wa.gov/programs/hwtr/demodebris/index.html>> accessed 5/7/04.

Washington State Department of Ecology (WDOE 2004-2). "Disposal." (Excel file linked to this page; sheet total "02.") Available at <<http://www.ecy.wa.gov/programs/swfa/solidwastedata/disposal.asp>> accessed 5/10/04.

If you need this information in an alternate format, please call the Solid Waste and Financial Assistance Program at 360-407-6900. If you are a person with a speech or hearing impairment, call 711, or 800-833-6388 for TTY.