Sandra Mallory
DPD Sustainable Building Policy REP
August 30, 2011
Version #5

# Mayor's Recommendations:
# Sustainable Buildings and Sites Policy

## Table of Contents

I. EXECUTIVE SUMMARY: Mayor's Recommendations ..... 2
II. EXISTING SUSTAINABLE BUILDING POLICY: IMPLEMENTATION RESULTS ..... 3
Background ..... 3
Implementation ..... 4
Environmental Benefits ..... 7
Growth of Green in the Private Sector ..... 10
Municipal Green Building Policies ..... 12
Financial Costs & Benefits ..... 13
Conclusion ..... 17
III. UPDATED SUSTAINABLE BUILDINGS & SITES POLICY: DEVELOPMENT PROCESS ..... 19
IV. UPDATED SUSTAINABLE BUILDINGS & SITES POLICY: RECOMMENDATIONS ..... 21
New Construction, Additions and Major Renovations – Large Projects ..... 21
New Construction, Additions and Major Renovations – Small Projects ..... 22
New Construction and Major Renovations - Pilot ..... 23
Minor Renovations and Tenant Improvements – Small Projects ..... 24
Sites ..... 24
Sites - Pilot ..... 25
Procedures ..... 25

## I. EXECUTIVE SUMMARY: Mayor's Recommendations

This proposal updates the City of Seattle's Sustainable Building Policy for the first time since its creation in 2000. The existing Sustainable Building Policy articulates the City's commitment to environmental, economic and social stewardship and sets the expectation that new municipal facilities meet established green building standards. Specifically, it calls for all new construction and major remodel projects over 5,000 square feet to achieve a LEED Silver rating. When adopted, this policy was the first of its kind in the nation and represented a ground-breaking approach to demonstrating City leadership and transforming the marketplace.

It is time for the City to update its policy. Since 2000, the green building community has experienced exceptional growth in expertise and capacity. Many cities and states, recognizing this change, have adopted green building standards that go well beyond Seattle's policy both in scope and aggressiveness. The proposed update represents a comprehensive approach that reflects advances in the green building industry, aligns the policy with the City's increased attention to climate change, addresses a greater range of project types, and ensures that Seattle continues to provide leadership that advances sustainable development in both the public and private realms.

The updated policy would

- Raise the minimum required green building rating to LEED Gold;
- Set minimum requirements for energy and water efficiency, construction waste reductions, and bicycle commuting for new construction, additions and major renovations;
- Broaden the scope to address projects smaller than 5,000 square feet, tenant improvements and sites;
- Establish pilot projects to test new approaches and standards, such as the Living Building Challenge and the Sustainable Sites Initiative;
- Update guidelines, procedures, and responsibilities to facilitate implementation; and
- Require annual reporting of performance under the policy and ongoing program evaluation.

Additionally, the proposed resolution would direct City departments to evaluate and improve existing standards and processes that relate to tenant improvements, leasing, and site management.

The policy being proposed is the result of significant participation of an interdepartmental advisory committee, direction from the Mayor and Council, input from focus groups and private stakeholders, and City Green Building's own evaluations of the existing policy, green building policies of other jurisdictions, work in the private market, and assessments of costs and benefits of the proposed policy. The proposal represents a careful balance between a desire to take bold action and the need to recognize the limited resource capacity of capital departments.

## II. EXISTING SUSTAINABLE BUILDING POLICY: IMPLEMENTATION RESULTS

### Background

In 2000, Seattle became the first city in the nation to formally adopt a policy to improve the environmental performance of municipal facilities. Resolution #30121, passed unanimously by City Council on February 22nd 2000, requires new construction & major remodels over 5,000 square feet to achieve a LEED Silver rating. Per the resolution:

> *It shall be the policy of the City of Seattle to finance, plan, design, construct, manage, renovate, maintain, and decommission its facilities and buildings to be sustainable. This applies to new construction and major remodels in which the total project square footage meets the criteria given. The US Green Building Council's LEED (Leadership in Energy and Environmental Design) rating system and accompanying Reference Guide shall be used as a design and measurement tool to determine what constitutes sustainable building by national standards. All facilities and buildings over 5,000 gross square feet of occupied space shall meet a minimum LEED Silver rating.*

The Sustainable Building Policy was developed as part of the City's Environmental Management Program (EMP). In 1996 the Mayor and Council established an Environmental Management Initiative to ensure that the City, as a corporate entity, incorporate a high level of environmental stewardship into its daily activities. The EMP, adopted in 1999, established environmental goals and policies and provided the framework for management and accountability. Areas of City operations that most impact the environment had been identified, from landscape management to use of chemicals to fleet fuel use, and policies to improve the City's environmental performance in each of those areas were developed for inclusion in the EMP. The original EMP contained a placeholder for Sustainable Building.

The Office of Environmental Management (OEM) was established in 1999 to guide City operations towards sustainability by coordinating implementation of Seattle's E M P and the Mayor's Environmental Strategy. A separate Green Building Team,[1] an interdepartmental committee of technical, policy and program staff, was formed to develop the sustainable building policy and to plan for its implementation. The policy was added to the EMP in 2000.

The policy was tied to the Leadership in Energy and Environmental Design (LEED™) system, an internationally recognized green building rating system developed by the US Green Building Council (USGBC). Projects are rated according to their level of environmental performance – Certified, Silver, Gold, or Platinum. The rating system provided a measureable standard that could be used as a target-setting tool, as a framework for

[1] The Green Building Team included representatives from the Office of Environmental Management, DCLU, City Light and Seattle Public Utilities (City-owned utilities), Parks, Executive Services and the Seattle Lighting Design Lab.

designing and building green projects, and as a means to assess progress. By utilizing LEED™, an independent, national third-party would be responsible for third-party verification of performance.

The purpose of the existing City-wide policy on sustainable building was to demonstrate the City's commitment to environmental, economic , and social stewardship; to yield cost savings to the City taxpayers through reduced operating costs; to provide healthy environments for staff and visitors; and to contribute to the City's goals of protecting, conserving, and enhancing the region's environmental resources. Additionally, the City intended to set a community standard of sustainable building and to lead by example.

**Implementation**

When the policy was adopted in February of 2000, the City had a dozen projects in design or about to enter into design. Incorporating LEED criteria into the projects already in process, with pre-established budgets, required City project managers and design teams to re-think design solutions. While some of these early projects were unable to achieve a LEED Silver level, they nonetheless incorporated significant green strategies into the completed projects. For instance, Fisher Pavilion which achieved a LEED™ Certified rating still reduced potable water use by 50%, uses 25% less potable water for irrigation, used 49% of materials from regional sources, decreased impervious surfaces by 16%, and recycled 87% of construction and demolition waste.

Since that time, the green building expertise within City departments and within the private sector has grown substantially and a LEED Silver project has become a relatively low threshold. Implementation of the policy evolved over the ten-year period as the design and construction market matured and project managers gained experience achieving LEED certification on their capital projects. To date, twenty-seven projects have been completed under the policy. Two projects received a LEED Certified rating, seven projects achieved LEED Silver, and sixteen projects surpassed the threshold to achieve LEED Gold. The chart below shows the City building projects that have been completed from the time the resolution was adopted in February 2000 until February 2011.

Figure 1: City of Seattle Projects since adoption of the Sustainable Building Policy (Feb. 2000 – Feb. 2011)

| Project | Department | Year Completed | Certification Level |
|---|---|---|---|
| Fisher Pavilion | Seattle Center | 2002 | Certified |
| Seattle Justice Center | FAS | 2002 | Silver |
| McCaw Hall | Seattle Center | 2003 | no rating |
| Southwest Precinct | FAS | 2003 | no rating |
| Carkeek Park Environmental Learning Center | Parks | 2003 | Gold |
| Seattle Central Library | Seattle Public Library | 2004 | Silver |
| Cedar Water Treatment Facility Operations Bldg | SPU | 2004 | Gold |

| | | | |
|---|---|---|---|
| Park 90/5A – Airport Way Center | FAS | 2004 | Silver |
| Park 90/5C – Airport Way Center | FAS | 2004 | Gold |
| Highpoint Community Center | Parks | 2004 | Certified |
| Yesler Community Center | Parks | 2005 | Gold |
| Northgate Civic Center | Parks | 2006 | Gold |
| Zoomazium | Woodland Park Zoo | 2006 | Gold |
| North Cascades Environmental Learning Center | SCL | 2006 | Silver |
| Seattle Joint Training Facility | FAS | 2006 | Silver |
| Seattle City Hall | FAS | 2007 | Gold |
| Montlake Community Center | Parks | 2007 | Gold |
| Operations & Control Center | SPU | 2007 | Gold |
| Fifth Avenue Garage | Seattle Center | 2008 | Gold |
| Firestation 10 | FAS | 2008 | Silver |
| Firestation 28 | FAS | 2009 | Gold |
| West Entry | Woodland Park Zoo | 2010 | Gold |
| Firestation 17 | FAS | 2010 | Silver |
| Firestation 35 | FAS | 2010 | Gold |
| Firestation 39 | FAS | 2010 | Gold |
| Firestation 37 | FAS | 2010 | Gold |
| Firestation 30 | FAS | 2011 | Gold |

If LEED wasn't applicable to particular projects, project managers and design teams were still encouraged to apply the portions of the LEED rating system which made sense for their project, and to seek out other project goals that would increase the environmental, social, and economic benefits of the project. The Seattle Municipal Tower (SMT) renovation provides a prime example. The project minimized energy consumption, provided good indoor air quality, and made extensive use of recycled content and rapidly renewable materials.

Individual departments have also expanded the intent of the policy by developing their own standards. Finance and Administrative Services, in part based on their experience with SMT, created Capital Green, a green building evaluation and implementation tool they use for smaller projects and tenant improvements. Parks uses their own Ideal Green Parks tool and both Parks and Seattle Center are conducting pilot projects using the Sustainable Sites Initiative, a national sustainable landscaping rating system under development.

The existing Sustainable Building Policy encourages project managers and design teams to meet higher LEED rating levels. The success of the policy has been, in no small part, due to the commitment and innovation of

capital department staff in both meeting and exceeding the requirements of the policy. "From interviews with City project managers and staff, it is clear that despite the policy's non-binding nature, departments do not view the policy as voluntary. Instead, internal pressure from the City's high-level directors and officials has ensured that all applicable capital projects have been designed and constructed in a sustainable manner to the minimum guidelines of the policy and beyond."[2] Many departments pursued LEED Gold Certification outright by including this performance level in the project's bid documentation. Others encouraged project teams to incorporate as many sustainable features as possible.

Initially, basic education on LEED was provided to introduce staff and consultants to green building and the USGBC's rating tool. As the LEED rating system came into greater use, more specialized training courses were offered. *Succeeding with LEED through successful project management* was developed and taught in 2006. Integrated Design Process Training Workshops were developed and taught in 2008 – 2009. At one time, the City of Seattle had the greatest number of LEED Associated Professionals (AP) for any organization. Over 50 current or past Seattle city staff hold the LEED AP title. This number continues to grow with more staff seeking the newly created LEED Green Associate professional accreditation.

To assist project managers as they implemented LEED, the City, with the help of a green building consultant, developed a City of Seattle CIP Supplement to the LEED Green Building Rating System: *A Handbook for Achieving LEED Silver and Beyond on City of Seattle Capital Improvement Projects.* This document was produced in 2000 and updated in 2001. To complement this handbook, a series of tools were developed and posted on the web for both project managers and consultants. These included:

- Project manager LEED certification task list
- Sample language for LEED projects
- Energy baseline for Seattle projects
- Additional resources to help achieve specific LEED credits

Over the course of implementing the policy, case studies have been developed documenting how projects have achieved LEED certification. These publications allow other project managers to learn how each project approached sustainability, which types of LEED credits the project received and to understand lessons learned.

To support the Fire Facilities and Emergency Response Levy Program, City Green Building developed a comprehensive education program to prepare project managers and consultants on how to achieve and exceed the City's sustainable building policy. Two training sessions were offered. *Delivering LEED Fire Facilities: Advanced Training* focused on case studies, costs/benefits, challenges and lessons learned. A full-day *Fire Facilities Eco Charrette* established guiding principles and performance standards for the Fire Facilities and Emergency Response Levy Program. Lastly, a series of technical briefs, specific to fire stations, were developed with the assistance of consultants.

[2] Bosisio, Landon P., *The City of Seattle's Sustainable Building Policy: Strategies for Implementation and Evaluation*, Evans School Clinic, June 2011.

**Environmental Benefits**

The impact of the sustainable building policy can best be evaluated based on the environmental benefits that have accrued as a result of the policy. The chart below shows key LEED credits and strategies and how many of the City's projects implemented those strategies. The chart reveals that a breadth of environmental approaches, from stormwater control to recycled content materials, have been utilized and that certain approaches are essentially standard practice and are achieved by almost all projects.

Figure 2: Number of New Construction Projects achieving key LEED Credits / Performance Levels

| | |
|---|---|
| | Total Projects = 22 |
| | **# of Projects Achieving Each Criteria** |
| **Sustainable Sites** | |
| ***Alternative Transportation—Bicycle Storage and Changing Rooms:** Provide secure bicycle racks or storage and shower and changing facilities | **19** |
| **Alternative Transportation—Parking Capacity:** Size parking capacity to not exceed minimum local zoning requirements and provide preferred parking for carpools and vanpools | **13** |
| **Stormwater Design—Quantity Control:** 25% decrease in volume of runoff from the two-year, 24-hour design storm. For undeveloped sites, runoff not to exceed pre-development levels. | **10** |
| **Stormwater Design—Quality Control:** Reduce water pollution by reducing impervious cover, increasing on-site infiltration, eliminating contaminants and removing pollutants. | **8** |
| **Water Efficiency** | |
| **Water Efficient Landscaping - Reduce by 50%:** Reduce potable water use for irrigation by 50% | **20** |
| **Water Efficient Landscaping - Reduce by 100%:** No potable water used for irrigation | **14** |
| **Innovative Wastewater Technologies:** Reduce potable water use for building sewage by 50% | **5** |
| **Water Use Reduction - 20% reduction:** compared to a baseline with code fixture requirements | **18** |
| ***Water Use Reduction - 30% reduction:** compared to a baseline with code fixture requirements | **13** |

| Energy and Atmosphere | |
|---|---|
| **Optimize Energy Performance:** Achieve performance beyond baseline to ASHRAE 90.1 2007 | |
| **14% energy reduction** | **20** |
| **20% energy reduction** | **17** |
| **26% energy reduction** | **9** |
| **30% energy reduction** | **3** |
| **Materials and Resources** | |
| **Construction Waste Managemen**t **- Divert 50% from Disposal**: Recycle and/or salvage 50% of nonhazardous construction and demolition debris | **22** |
| **Construction Waste Managemen**t **- Divert 75% from Disposal** | **21** |
| ***Construction Waste Managemen**t **- Divert 90% from Disposal** | **13** |
| **Recycled Content - 10%:** of total material content to be from recycled content | **20** |
| **Recycled Content - 20%:** " " | **16** |
| **Regional Materials 10%:** of building materials and products have been extracted, harvested or recovered, as well as manufactured, within 500 miles of the project site | **21** |
| **Regional Materials - 20%:** " " | **16** |
| **Certified Wood:** 50% wood materials and products certified by the Forest Stewardship Council | **9** |
| **Indoor Environmental Quality** | |
| **Low-Emitting Materials—Adhesives and Sealants:** Materials used on the interior of the building to be non-odorous, non-irritating and non-harmful to installers and occupants | **20** |
| **Low-Emitting Materials—Paints and Coatings:** " " | **20** |
| **Low-Emitting Materials—Flooring Systems:** " " | **19** |
| **Low-Emitting Materials—Composite Wood and Agrifiber Products:** Products used on the interior of the building must contain no added urea-formaldehyde resins | **15** |
| **Daylight and Views—Daylight:** Provide occupants with daylight into regularly occupied areas | **10** |

* Criteria included as requirement in proposed policy update

The impact on resource conservation of achieving particular LEED credits has been evaluated using LEED documentation. An analysis of LEED documentation for eighteen City LEED projects provides background on the energy, water, waste and transportation impacts of the policy. See figure 3, below.

Figure 3: Total Environmental Benefits of 18 City LEED Projects certified 2003 - 2010

| | |
|---|---|
| Annual Projected Energy Savings<br>*(compared to LEED baseline, ASHRAE 90.1)** | 48,987,100 kBtu/yr<br>(= 14,356,701 kWh) |
| Annual Projected CO2 Emission Reduction<br>*(resulting from energy savings)* | 12,876,500 lbs/yr |
| Annual Projected Electricity Savings | 765,455 kWh/yr |
| Annual Projected Potable Water Savings | 4,368,100 gallons/yr |
| Annual Projected Stormwater Reduction | 1,062,180 gallons/yr |
| Construction Waste Diverted | 47,100 tons |
| Total Bike Parking Spaces Added | 152 |
| Total Number of Showers Added | 66 |

**ASHRAE 90.1 is a national standard against which all LEED projects are compared. The Seattle Energy Code is more stringent than ASHRAE 90.1, therefore relative savings against the SEC would be less.*

The energy and water savings noted in figure 3 are based on energy models and water calculations reflecting projected savings at project completion. Determining the actual energy and water performance can only be accomplished by evaluating energy and water consumption over time after occupancy.

Energy and water utility cost savings were documented for the Justice Center and City Hall as part of a performance evaluation[3]. The Justice Center was completed in 2002 and received a LEED Silver rating. It is 26% more energy efficient than a baseline building built to the 1997 Seattle Energy Code. City Hall was completed in 2007 and achieved LEED Gold. It is 17% more energy efficient than a baseline building built to the 2003 Seattle Energy Code.

Figure 4: Energy Savings[4] for the Justice Center

| | Seattle Energy Code Baseline | As Built |
|---|---|---|
| Electricity Consumption (kWh) | 6,151,500 | 4,791,900 |
| Gas Consumption (Therms) | 151,000 | 116,000 |
| Total Energy Consumption (MBtu) | 36,100 | 28,000 |
| % Energy Savings ( Total Loads) | | 22% |
| **% Energy Savings (regulated loads)** | | **26%** |

[3] Paladino & Co. for City Green Building, *Performance Evaluation Report: Seattle City Hall and Justice Center*, 2008.

[4] Regulated energy use" includes only the energy associated with heating, cooling, auxiliaries (pumps, fans, etc.) water heating and interior lighting. All other energy uses in the building (plug, process loads, garage ventilation, exterior lighting, elevators etc.) are excluded. Savings are reported based on the regulated energy use because this is the energy use that is affected by the building and mechanical system design and is the basis for comparison for the LEED 2.1 Rating System under which City Hall and Justice Center were certified. *Performance Evaluation Report*, Sec. 2 p. 10.

Figure 5: Energy Savings for City Hall

| | Seattle Energy Code Baseline | As Built |
|---|---|---|
| Electricity Consumption (kWh) | 3,513,400 | 2,500,400 |
| Gas Consumption (Therms) | 55,100 | 63,500 |
| Total Energy Consumption (MBtu) | 17,500 | 14,900 |
| % Energy Savings ( Total Loads) | | 15% |
| % Energy Savings (regulated loads only) | | 17% |

The evaluation also analyzed water savings for both projects. The Justice Center is 46% more water efficient (per FTE) than the previous Public Safety Building. City Hall is 40% more water efficient (per FTE) than the previous Municipal Building.

Figure 6: Annual Water Savings

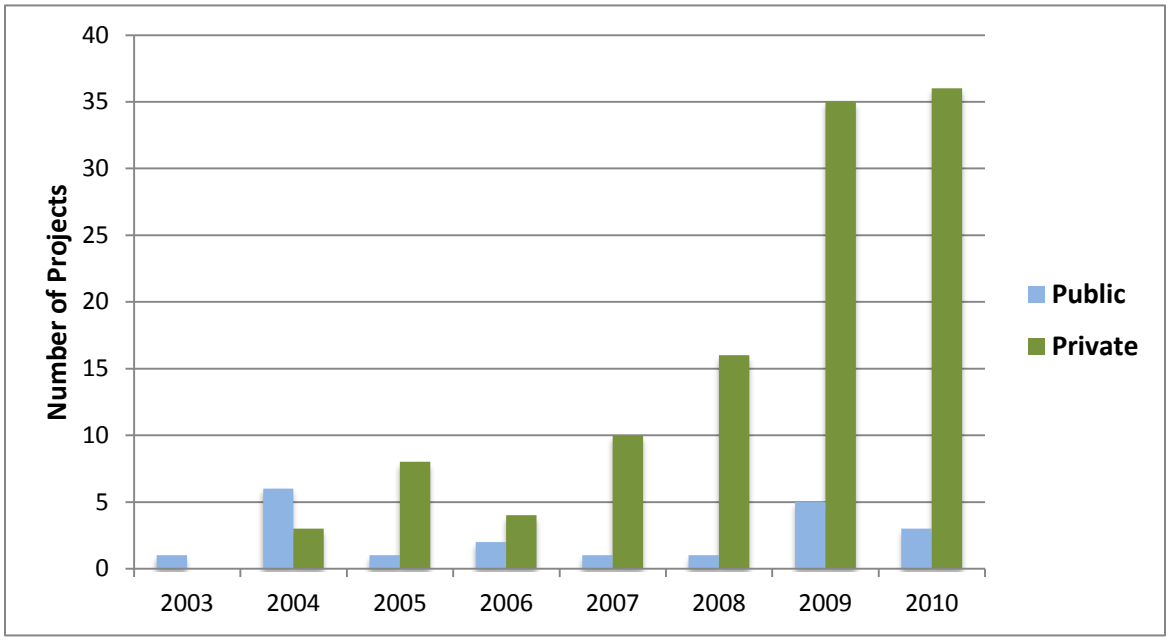
| Justice Center | |
|---|---|
| Justice Center Average Annual Water Use Gal/FTE/Month | 406 |
| Public Safety Building Average Annual Water Use Gal/FTE/Mont | 747 |
| Total Annual Water Savings in gallons | 2,703,700 |

| City Hall | |
|---|---|
| City Hall Average Annual Water Use Gal/FTE/Month | 258 |
| Muni Building Average Annual Water Use Gal/FTE/Month | 426 |
| Total Annual Water Savings in gallons | 731,100 |

**Growth of Green in the Private Sector**

The City's proactive leadership with public projects, coupled with the City's green building initiatives for the private sector, established Seattle as an early leader in market transformation toward sustainable building. Following on the heels of the City's lead, green building in the private market has grown exponentially since 2000. Resolution 30280, passed in 2001, called for the acceleration of the City of Seattle's Green Building Program and the expansion and promotion of sustainable building practices throughout the city. The Green Building Program developed educational materials, provided trainings in sustainable building for private-sector development professionals, and worked directly with project design teams through programs such as the LEED Incentive Program to develop green building talents and capacity. The results of those efforts are shown in the charts below.

Figure 7: City Owned and Private Sector Projects achieving LEED Certification 2003-2010




As the sustainable development grew in both the public and private sectors, the sustainability expertise in the design and construction community grew concurrently. Projects in Seattle are now achieving higher LEED ratings; LEED Silver is no longer the leading edge. In recent years, there has also been a shift in the types of projects pursuing LEED. Given the slow rate of new construction, as well as the greater understanding that addressing our existing building stock is key to improving our overall resource efficiency, we are seeing greater numbers of existing buildings becoming LEED certified.

Figure 8: Seattle LEED projects by Certification Level

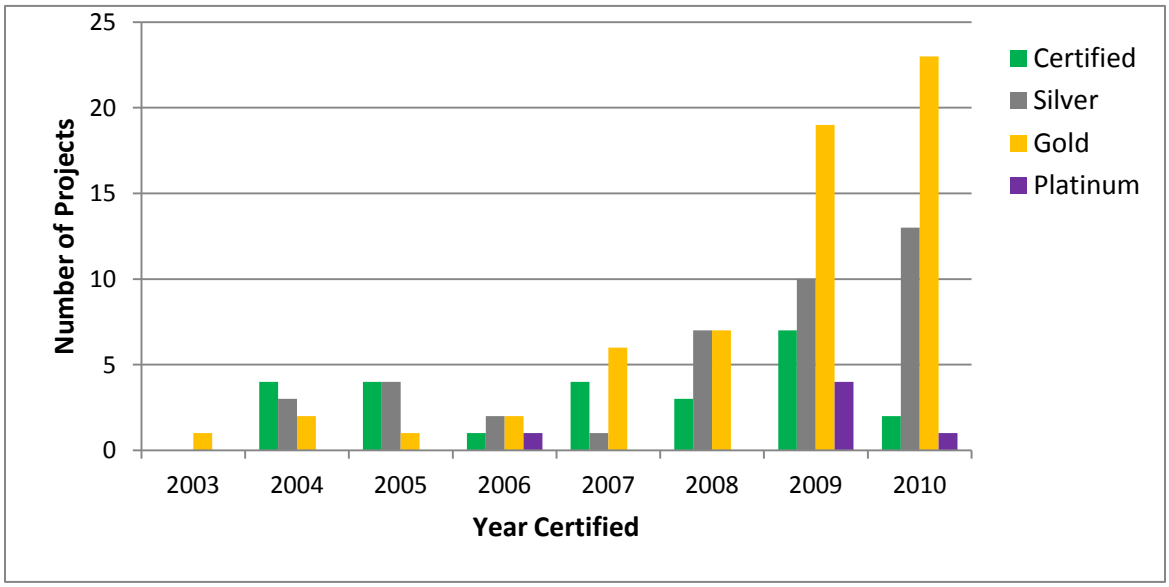
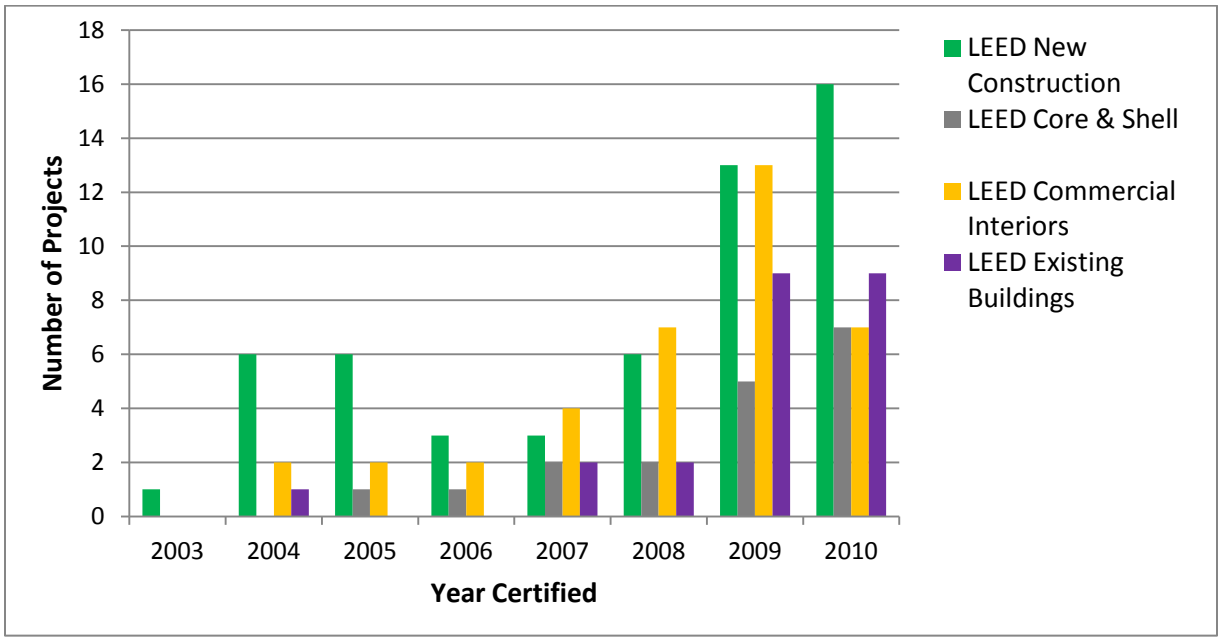


Figure 9: Seattle LEED projects by LEED Rating System 2003 - 2010




**Municipal Green Building Policies**

As LEED became the preferred benchmarking standard to define sustainable building and an avenue to exhibit civic leadership, many other jurisdictions have adopted resolutions and policies providing requirements for both public and private buildings. "LEED initiatives including legislation, executive orders, resolutions, ordinances, policies, and incentives are found in 45 states, including 442 localities (384 cities/towns and 58 counties), 35 state governments (including the Commonwealth of Puerto Rico), 14 federal agencies or departments, and numerous public school jurisdictions and institutions of higher education across the United States."[5]

Although Seattle was the first to implement a municipal policy, since then jurisdictions throughout the US and Canada have surpassed Seattle with a variety of municipal policies that tackle environmental priorities more consciously and aggressively. Vancouver, BC; King County; and Portland, OR; all require their municipal buildings to be LEED Gold. Vancouver, BC, is developing a Living Building Challenge project. In addition, many entities (e.g. Vancouver, BC; New York City; and the states of Minnesota and New York) include specific energy-efficiency criteria with their policies.

While the majority of the policies impacting municipal facilities require third-party certification through LEED, some require LEED plus additional criteria. Jurisdictions also rely on other third-party systems, such as Energy Star or Green Communities. Washington State has developed its own rating systems that apply specifically to

[5] US Green Building Council, *Public Policies Adopting or Referencing LEED*, usgbc.org, accessed July 22, 2011.

schools and to affordable housing. See Attachment A for an overview of sustainable building policies of other jurisdictions.

**Financial Costs & Benefits**

The financial impacts of achieving LEED Silver under the existing policy consist of both costs and savings. Costs for a LEED project include both soft costs and hard costs. Soft costs cover LEED certification fees, consultant costs for LEED documentation, and for design and engineering related to achieving LEED standards. Hard costs cover the incremental construction costs specific to meeting LEED standards. Savings related to a LEED project include one-time utility incentives for energy and water-efficiency measures as well as annual utility savings accruing from reduced energy and water use.

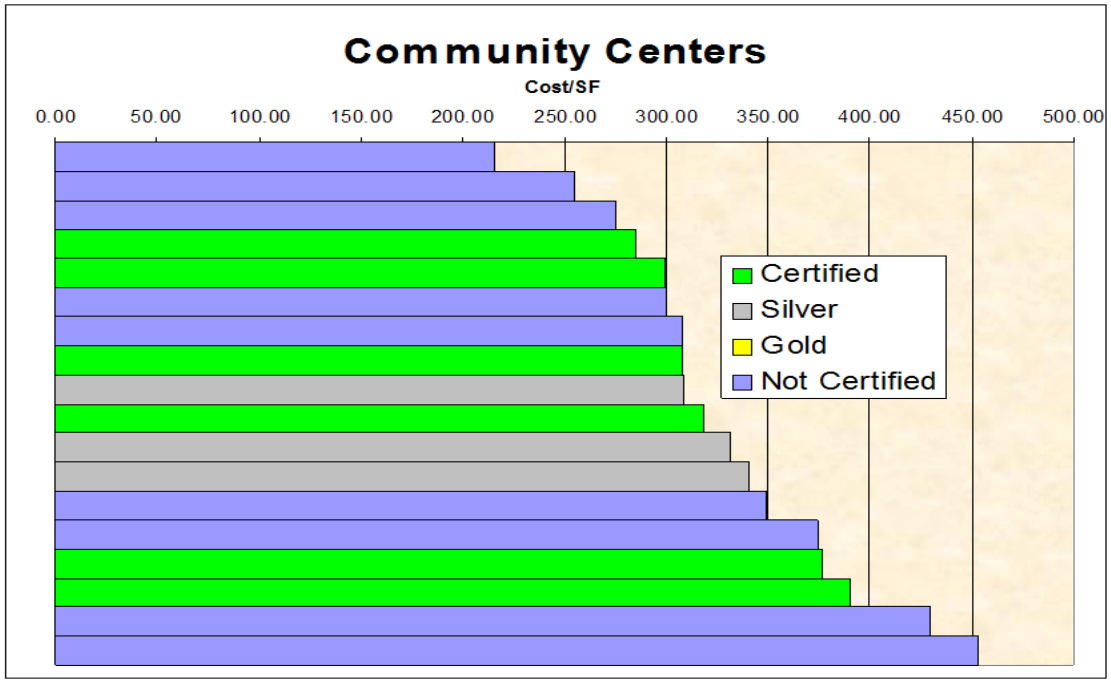
LEED-related costs and savings for City LEED projects have not generally been documented as separate line items. However, there is information available on overall project costs for a number of projects as well as specific cost and savings information for selected projects that helps to provide a sense of financial impacts. Additional information from the State of Washington and from national studies helps to round out the understanding of financial impacts. Figure 10 below shows the range of project costs for City projects completed since the implementation of the existing policy. The chart shows no identifiable correlation between project cost and level of LEED certification.

Figure 10 – City of Seattle New Construction Projects – Project Cost per Square Foot

Similar results have been reported by the State of Washington and in national studies. Of sixteen State projects required to meet a LEED Silver rating, four achieved Silver, eleven Gold, and one reached Platinum. No relevant relationship between construction cost and LEED rating can be implied. In fact, the cost for the LEED Platinum project is at the median of costs for all 16 projects. As the State report notes, there are myriad influences on the cost of a building (e.g. size, complexity of systems, materials, time of year bid) unrelated to its LEED status.[6]

A 2007 study by Davis Langdon compares construction costs of a variety of building types from around the country and concludes that "there is no significant difference in average costs for green buildings as compared to non-green buildings." The chart in Figure 11 compares the construction costs of nine LEED and nine non-LEED Community Centers.

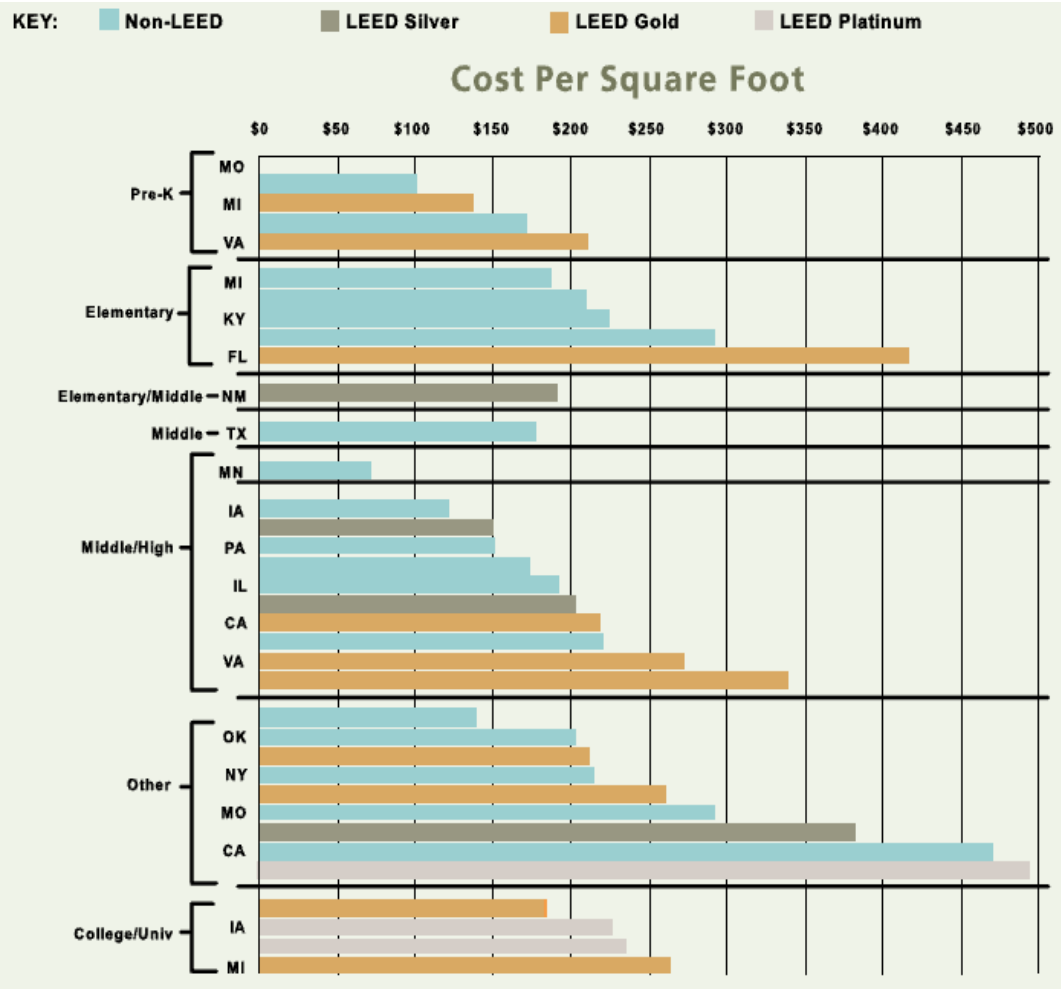
Figure 11: Construction Cost per Square Foot[7]




[6] General Administration of Washington, *Implementation of RCW 39.35D – High-Performance Green Building*, September 2010

[7] Reprinted with permission from "The Cost of Green Revisited: Reexamining the Feasibility and Cost Impact of Sustainable Design in the Light of Increased Market Adoption," by Peter Morris and Lisa Fay Matthiessen, published by Davis Langdon in July 2007. The full report can be found at: http://www.davislangdon.us/USA/Research/ResearchFinder/2007-The-Cost-of-Green-Revisited/

Figure 12: Construction Cost per Square Foot[8]




Soft Costs

Finance and Administrative Services has tracked the costs of LEED certification and documentation and LEED-related design and engineering fees for Fire Station projects. To date, these include seven completed neighborhood fire stations. The neighborhood station projects are all relatively small, with overall project costs from ranging from $4,171,000 for Fire Station 37 (9,280 square foot) to $10,603,000 for Fire Station 28 (18,941

[8] Reprinted with permission from "The True Value of Green," by John Chadwick, AIA, RIBA with Davis Langdon, An AECOM Company, Fall 2010 LEARNING BY DESIGN, a supplement to *American School Board Journal*, published by National School Boards Association and Stratton Publishing & Marketing Inc. © NSBA.

square foot).[9] Soft costs related to LEED for these seven projects ranged from $38,000 to 61,500, from .47% to 1.31% of the overall project cost.[10]

Carkeek Park Environmental Learning Center, one of the first of the City's LEED projects in 2003, and the first to achieve a LEED Gold rating, had LEED-related soft costs of $38,170, 5% of total project costs.[11] The higher percentage, as compared to the Fire Stations, can be partly attributed to its small size, only 1,750 square feet, and its small budget, $767, 506. The cost of the design team effort to design and document strategies for LEED credits is relatively insensitive to scale, requiring about the same effort for a small project as for a large project.

Construction Costs

The additional LEED-related construction cost at Carkeek was $19,136, or 6.75% of the project cost. The incremental cost covered photovoltaic panels, a rain-collection cistern, and efficient heating and electrical equipment. The total LEED-related costs as a percentage of the overall project cost was 7%. While LEED costs for Carkeek were relatively high, its per-square-foot cost was in fact less than two other City parks projects "with distinct programmatic and design requirements comparable to the Environmental Learning Center." Project costs for Carkeek were $439/sf. Camp Long West Comfort Station, completed in 2002, cost $542/sf and the Cal Anderson Shelterhouse at Lincoln Reservoir, completed in 2003, cost $614/sf. Neither of those more costly projects incorporated sustainable building features.[12]

Construction costs related to LEED were estimated for City Hall and the Justice Center, based on information available from the project managers. The additional costs were $1,100,000 for City Hall and $1,728,100 for the Justice Center, 2% and 2.5% of construction costs, respectively.

Information from State projects completed under the High-Performance Green Building legislation between 2008 and 2010 indicates that the incremental construction costs associated with LEED (after utility incentives) ranges from a *savings* of 2.3% to an additional cost of 3.9%, with a median of 0.6% additional cost.[13]

Financial benefits

The additional construction costs for City Hall and the Justice Center don't take into account the utility incentives received by each project for their energy and water-saving features. City Hall received $420,160 and

[9] Finance and Administrative Services, Fire Facilities and Emergency Response Levy Program, June 2011 Executive Financial Summary
[10] Finance and Administrative Services, MACC and LEED Registration, Documentation and Consultant Costs. Personal Communication with Teresa Rodriquez, June 2011
[11] Office of City Auditor, *Carkeek Park Environmental Learning Center Cost Review*, April 30, 2004
[12] Office of City Auditor, *Carkeek Park Environmental Learning Center Cost Review*, April 30, 2004
[13] General Administration of Washington*, Implementation of RCW 39.35D – High-Performance Green Building*, September 2010

the Justice Center $423,070, covering 38% and 25%, respectively, of the increased construction costs. As part of the performance evaluation of the two projects noted above, an analysis of the financial return was conducted. As noted above, both had significant resource conservation benefits. The energy and water use efficiencies result in utility savings of $58,000 per year for City Hall and $113,400 per year for the Justice Center. The net present value, calculated over 25 years at a 6% discount rate comes to $1,160,000 for City Hall and $528,000 for the Justice Center. At a 2% discount rate, the net present value is $1,580,000 for City Hall and $1,400,000 for the Justice Center.[14]

In a recent study in Minnesota, a net benefit was found, over an assumed building life of 20 years, for state projects required to meet energy efficiency levels at least 30% better than the Minnesota State Energy Code. The Minnesota Center for Energy and Environment performed a life-cycle cost-effectiveness analysis on 115 buildings, across building types, expected to achieve a minimum of 40% savings. By analyzing the upgrade costs and energy savings they found that the benefits (i.e. savings) were at least equal to, and for the majority of the buildings at least twice as much as, the incremental cost of the energy-efficient strategies over an assumed life of twenty years. Given that City of Seattle buildings are built for a much longer life, the actual savings would continue well beyond twenty years. The study also found that "very large reductions in energy use can often be achieved as cost-effective as lower levels of energy savings."[15]

**Conclusion**

The existing Sustainable Building Policy has been effective at integrating sustainability into the design and construction of the City's buildings and in initiating increased attention to green building in both the private sector and in other jurisdictions. The policy has ensured that City buildings contribute to reducing our environmental impact and, based on the available data, appears to provide long-term financial benefits. With the exponential growth of green building in the private market, the widespread adoption of more aggressive policies in other jurisdictions, and the City's growing attention to addressing climate change, the policy no longer places the City in a leadership position nor does it adequately address the City's current environmental goals. Similarly there are key gaps in the policy that, if addressed, would allow Seattle to more fully realize environmental and financial benefits in the long term operations of its facilities.

- Policy Scope. The existing policy covers only new construction above 5,000 square feet. As such, it does nothing to address the opportunities in smaller projects, tenant improvements, existing buildings or sites. The twenty-seven building projects completed between February 2000 and February 2011 under the existing policy are only a small fraction of the City's overall building stock.
- Performance Criteria . The LEED system allows for flexibility in utilizing strategies appropriate for individual projects. However, there are no guarantees that a project will achieve particular performance

[14] Paladino & Co. for City Green Building, *Performance Evaluation Report: Seattle City Hall and Justice Center*, 2008
[15] *Cost-Effectiveness & Utility Support Program for Center,* for Sustainable Building Research and Office of Energy Security, Center for Energy and Environment, June 2009

levels. For instance, the minimum LEED energy requirements are essentially equivalent to meeting the Seattle Energy Code, so even though a City project may be LEED rated it will not necessarily provide any energy benefits. Eight of the twenty-two LEED new construction projects identified in Figure 2 did not incorporate energy efficiency beyond the minimum code in place at the time.

- Performance. There is minimal information available from the existing City LEED projects that identifies how well the projects are performing. The majority of data that is available is limited to projected performance. Especially important is understanding the effectiveness of resource conservation approaches. Only two projects, City Hall and the Justice Center, have been evaluated to assess how well they are operating and whether they are providing the expected benefits. Without this information it is difficult to properly evaluate the effectiveness of the policy overall and to learn from the operations of the facilities already in place.
- Costs & Savings. There is minimal information available identifying the costs and savings related to the sustainable design, construction and operations of the City's existing green buildings. Data identifying the long-term return on investment of sustainable approaches and a greater understanding of the operational impacts and savings would allow greater fiscal responsibility when developing project budgets.
- Life Cycle Costing. The lack of direct correlation between the capital costs for a project and the ongoing operational costs makes it difficult for departments to prioritize investments that might add initial cost but that would offer long-term savings.

## III. UPDATED SUSTAINABLE BUILDINGS & SITES POLICY: DEVELOPMENT PROCESS

In 2010, members of the City Green Building program within DPD began a process to update the existing Sustainable Building Policy that would align the policy with Seattle's current environmental goals and priorities. City Green Building began by meeting with staff in individual capital departments to better understand their work under the existing policy and where they saw opportunities for improvement. Under direction from the Mayor, City Green Building then convened an interdepartmental team to act as an advisory committee. The IDT includes representatives from FAS, Parks, Seattle Center, SPL, OSE, SPU, SCL, SDOT, OH, and CBO. Between August and December, City Green Building held six working sessions with the IDT to evaluate the successes and challenges of the existing policy, discuss policy approaches of other jurisdictions, develop goals and guiding principles, and create the framework for the update.

The IDT established the following goals and guiding principles for what an updated sustainable building policy should achieve.

Goals:

- demonstrate the City's commitment to addressing climate change and creating a sustainable future by protecting, conserving, and enhancing the region's environmental resources;
- provide leadership in setting community standards for sustainable development;
- provide responsible stewardship of the City's fiscal resources and public assets over time, leveraging our investments to create financial, public and environmental value; and
- create quality environments that are healthy and provide community benefit.

Guiding Principles:

- Be at the forefront of sustainable development, leading the way through both example and education and acting as a catalyst for change.
- Support innovation that is both environmentally and economically sound.
- Ensure that projects are designed at the highest level of resource efficiency, for economic viability, and practical operation over the long-term, by using whole building life-cycle assessment.
- Prioritize actual performance. Conduct continuous assessment and ongoing evaluation of City properties, using adaptive management and ongoing improvement to advance the performance of existing projects.
- Design for both permanence and adaptability, investing up front to ensure the long-term viability of City projects.
- Design projects that create a vibrant community and contribute to livable, walkable neighborhoods.
- Design for climate adaptability and resilience.
- Design to minimize our contribution to climate change.

A diagram showing comprehensive IDT and stakeholder involvement is included in Attachment B. In addition to the series of IDT meetings, City Green Building held focus- group meetings with capital facility project managers and operations & maintenance staff, as well as a session related to budget and financing which included capital departments and CBO. Mid-way through our work with the IDT, briefings were held with the Mayor, full Council, the Design Commission and the Planning Commission.

Concurrently, City Green Building has been participating in a Municipal Retrofits advisory group, led by OSE, to coordinate an approach for existing buildings.

In March, City Green Building presented draft recommendations to the IDT and then held a series of focused meetings on specific topic areas (e.g. new construction, tenant improvements). See Attachment C for an overview of the draft recommendations. We hosted additional discussions with project managers, operations staff, individual department staff, real estate staff in various departments, and private stakeholders. Additional briefings were held with the Capital Cabinet, the Mayor, and full Council to present the draft recommendations. Feedback regarding these recommendations informed the initial policy proposal.

The initial proposal for the resolution and accompanying policy was discussed with the IDT on June 9th and June 23rd, 2011. See Attachment D for an overview of the proposal. Based on those discussions and additional City Green Building investigation to answer questions raised by the IDT, the resolution and policy were revised and sent to the IDT on July 4th. Further revisions, based on IDT input, were made and the proposal was then sent for review, on July 20th, to Directors of all Departments impacted by the policy. Feedback from Directors and their staff has been incorporated into the final proposed resolution and policy.

## IV. UPDATED SUSTAINABLE BUILDINGS & SITES POLICY: RECOMMENDATIONS

The proposed legislation would update standards for the design, construction, and operation of City buildings and sites in order to reflect substantial changes that have occurred since the policy was first enacted in 2000 and to support current city-wide goals for sustainable development. Key changes include:

- Raising the minimum required green building rating to LEED Gold;
- Setting minimum requirements for energy and water efficiency, construction waste reductions, and bicycle commuting for new construction, additions and major renovations;
- Broadening the scope to address projects smaller than 5,000 square feet, tenant improvements and sites;
- Establishing pilot projects to test new approaches and standards, such as the Living Building Challenge and the Sustainable Sites Initiative;
- Updating guidelines, procedures, and responsibilities to facilitate implementation; and
- Requiring annual reporting of performance under the policy and ongoing program evaluation.

Additionally, the proposed resolution would direct City departments to evaluate and improve existing standards and processes that relate to tenant improvements, leasing, and site management.

The policy being proposed is the result of significant participation of the IDT, direction from the Mayor and Council, input from focus groups and private stakeholders, and City Green Building's evaluations of the existing policy, green building policies of other jurisdictions, work in the private market, and assessments of costs and benefits of the proposed policy. The proposal represents a careful balance between a desire to take bold action to meet the City's aggressive sustainability goals, develop Seattle's internationally-recognized green building industry, and ensure Seattle remains a role model for the nation, while also recognizing limited resource availability given current economic conditions.

The policy proposal is summarized below by project type.

**New Construction, Additions and Major Renovations – Large Projects**
Requirement: Meet a minimum LEED Gold rating and the following standards:

- 15% more energy efficient than the Seattle Energy Code
- 30% more water efficient than the Uniform Plumbing Code
- 90% waste diversion rate for construction involving demolition and 75% waste diversion rate for construction not involving demolition
- Provide bicycle parking and changing/shower facilities

The requirements apply to new construction and to major renovations that are 5,000 square feet or greater. Major renovations are projects that include both significant modifications to the building envelope as well as an overhaul of the HVAC system.

The LEED rating system continues to provide a valuable tool for project design and construction. LEED is used extensively in both the private and public sectors. It is a nationally-recognized and rigorous standard that provides third-party quality assurance and verification. This proposal would raise the certification level from Silver to Gold, while also creating additional minimum requirements tied to City priorities: energy & greenhouse gas reductions, water conservation, zero-waste, and transportation alternatives. Numerous other jurisdictions, including King County, Portland, and Vancouver, BC, already require LEED Gold certification for municipal building; however, few other municipality have specific targets outside of this rating system.

The decision to recommend a LEED Gold standard was based on the achievements of buildings built in the last ten years and discussion with the IDT. More than half of the City's existing LEED buildings already achieved LEED Gold including a variety of project types such as community centers, fire stations, operations facilities and offices. Discussion with City capital departments suggested that a minimum LEED standard would substantially improve the lowest performing projects, but would be very achievable across the City's portfolio. The City Green Building program also evaluated the potential for requiring Platinum certification; however, this level of certification was found to be impractical for many types of projects and it was determined that specific standards focused on City goals would be more effective.

The specific standards to be met, in addition to LEED Gold, will ensure that projects achieve minimum requirements tied to City priorities: energy & greenhouse gas reductions, water conservation, zero-waste, and transportation alternatives. The energy-efficiency standard corresponds with 2030 Challenge goals and is the same standard used with private green projects receiving priority permitting. The water-efficiency requirement has already been achieved by thirteen of twenty-two LEED new construction projects under the existing policy. Any LEED project must meet a minimum efficiency level of 20%; a 30% target will provide for a higher level of water conservation while still being reasonable and cost-effective. The use of high-efficiency toilets and urinals alone would get a project to an approximately 27% savings. The waste-reduction target has similarly been attained by thirteen of the City's twenty-two LEED new construction projects and will correspond with Seattle Public Utilities efforts to create improve the construction and demolition diversion rates. Bicycle parking and shower/changing facilities are an inexpensive means to incentivize reduced automobile use.

**New Construction, Additions and Major Renovations – Small Projects**
Requirement: Use Capital Green as an evaluation tool to assess appropriate sustainable strategies

The requirements apply to projects less than 5,000 square feet as well as those projects not eligible for a LEED rating.

LEED is a valuable tool for advancing the sustainability of City projects but it is not appropriate for all project scopes and budgets. Costs and time associated with LEED documentation and certification are relatively fixed and will be a greater percentage of the budgets of smaller projects. Yet small projects still provide a valuable opportunity and it's important that they be addressed to ensure that all of the City's buildings are built or

renovated in an environmentally-responsible manner. Capital Green is an evaluation tool developed by Finance and Administrative Services to assist project managers and consultants to identify and implement sustainable approaches in small-scale projects.

Capital Green is designed to encourage the use of high-performance methods and conservation efforts in the areas of site, water, energy, climate, materials, and indoor environmental quality. Using a checklist approach, project managers learn what strategies make sense for their particular project. The tool is internal to the City and therefore requires no third-party certification costs. However, any oversight or verification would need to be conducted by internal staff. Capital Green has been in use by the FAS facilities division but will be new to other departments. The proposed policy doesn't place any specific performance requirements on small projects but instead asks departments to utilize Capital Green for small projects so that sustainable strategies for each project can be identified.

City Green Building will work with FAS to facilitate the use of the tool by other departments, including any needed revisions to Capital Green and training for Project Managers on how to use the tool.

**New Construction and Major Renovations - Pilot**
Requirement: Commence design on one Living Building Challenge project by 2015

The Living Building Challenge is a sustainable building certification program that focuses on a performance-based, prerequisite-only approach to certification. To achieve certification, buildings must be self-sufficient for energy and water needs and meet advanced standards for elements such as material use and quality of the indoor environment. Certification isn't granted until one year after occupancy so that actual performance can be verified.

The Living Building Challenge has national traction as a standard that recognizes buildings meeting the highest levels of sustainability. The City has a pilot in place for private projects. The first project to participate in the pilot, the Bullitt Foundation's Cascadia Center for Sustainable Design and Construction, is under construction on Capitol Hill. If the City is to stay current with the advances in the sustainable building field, and especially if the City is to lead by example, then it is important to pilot the standard on one of our own facilities. A pilot will allow the City to demonstrate higher levels of environmental performance and to evaluate the Living Building Challenge as a tool for further City projects.

**Minor Renovations and Tenant Improvements – Large Projects**
Requirement: Meet a minimum LEED Gold rating and the following standards:

- 30% more water efficient than the Uniform Plumbing Code
- 75% waste diversion rate for construction involving demolition and 60% waste diversion rate for construction not involving demolition

Minor renovations and tenant improvements covers projects that don't include significant modifications to the building envelope. The requirements apply to projects that are 5,000 square feet or greater and which include substantial modification to all three of the major systems – mechanical, electrical, and plumbing.

LEED includes a suite of rating systems appropriate to different project types. In particular, with less new construction and greater re-use of existing buildings in the private market, LEED for Commercial Interiors has grown to be 24% of all LEED projects in Seattle. Of those LEED CI projects, 11% have achieved LEED Platinum and 47% LEED Gold. It is therefore a reasonable goal to have City tenant improvement projects meet the same certification level as for new construction. As with new construction, additional standards will ensure minimum performance. If the project's scope includes substantial modifications to plumbing, the opportunity to reduce water consumption should be taken. Diversion of construction waste can also be pursued although, consistent with LEED CI credits, it is required at a lower percentage, recognizing the more limited recycling opportunities in tenant improvement projects.

Two of the standards applied to new construction, however, are not as easily transferred to tenant improvements. Due to the range of project scopes and of existing conditions there is no singular energy metric that can be used as a requirement across all tenant improvement projects. Similarly, because energy efficiency of a building is intricately tied to the envelope conditions, it makes a holistic reduction in energy more challenging. Bicycle racks and shower/changing facilities may not be under the control of a tenant and are therefore not included as a minimum requirement.

**Minor Renovations and Tenant Improvements – Small Projects**
Requirement: Use Capital Green as an evaluation tool to assess appropriate sustainable strategies

The requirement applies to projects less than 5,000 square feet and/or those in which the scope of work doesn't include substantial modification to all three of the major systems – mechanical, electrical, and plumbing.

Capital Green can be used for any scope of work, from full tenant fit-outs to simply painting or replacing a boiler. It is, therefore, applicable to a wide range of smaller projects and provides the project manager with a tool for incorporating sustainable approaches into all building improvements.

**Sites**
Requirements: City departments to follow best management practices. Development or major renovation of Parks and Recreation property to complete an Ideal Green Parks checklist.

The City's stock of landscaped areas varies widely in scale, character, use, and level of sustainability. *S*eattle City Council adopted an Environmental Management Program in 1999, which included provisions directing departments to develop best management practices (BMPs) for landscape maintenance. Departments were to focus on reducing water consumption, landscape waste, and use of hazardous chemicals. Multiple departments

now have their own BMP, such as the Department of Parks and Recreation's "Best Management Practices for Landscape, Horticulture, and Forestry."

The proposed policy recognizes the practices that departments already have in place while at the same time calling for a more consistent city-wide approach to landscape maintenance which would help share knowledge between departments and encourage consistent practices by private vendors who maintain City landscapes. A sites committee would be established to develop core City-wide best management practices that are relevant to all departments.

Parks and Recreation, in cooperation with the University of Washington, has developed their own scoring system for construction of new parks and major renovations to existing parks. Ideal Green Parks credits focus on efficient use of resources and increasing the longevity of Parks investments. Ideal Green Parks is appropriate for Parks projects, but is not necessarily transferable to other departments.

**Sites - Pilot**

Requirement: Commence design on six Sustainable Sites Initiative projects by 2015, including two projects on Parks property, two projects in the right-of-way, and two projects outside of parks and the right-of-way.

Best management practices will address the ongoing operations of the City's landscapes, but don't fully cover new park construction and renovations. The Sustainable Sites Initiative (SITES) is a rating and certification system for the design, construction, operations and maintenance of sustainable landscapes. SITES measures environmental performance related to water, soil, vegetation, materials selection, and human health and well being. As of 2011, SITES is in pilot phase with final public release planned for 2013.

Three pilot projects are already underway, two in Parks and one at the Seattle Center. By completing additional pilot projects on a range of project types the City will be better able to evaluate if the SITES standard is appropriate for use by the City on a more comprehensive basis.

**Procedures**

Requirements: Sustainable Buildings and Sites Steering Committee and annual reporting

To help facilitate implementation of the policy and to coordinate across departments, the policy includes establishment of a steering committee. The steering committee would monitor participation, act as a venue for sharing best practices, identify and assist in developing training and tools needed by project managers and provide ongoing evaluation of the policy.

Evaluation of the policy requires that adequate data is available. As has been identified in relation to the current policy, without this information it is difficult to properly evaluate the effectiveness of the policy, identify environmental benefits, and understand costs and savings associated with the policy. To that end, departments

are asked to prepare yearly reports. City Green Building will compile departmental reports into an annual policy report and use the information for ongoing assessments.

Attachment A: Examples of Municipal Sustainable Building Policies
Attachment B: Sustainable Building Policy Update Process
Attachment C: Draft Recommendations Overview – Presented to IDT on March 10, 2011
Attachment D: Proposed Policy Overview: Revisions to March 10 Recommendations – Presented to IDT on June 9, 2011