



GSA Public Buildings Service

GSA LEED® Applications Guide



February 2005

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Availability

Electronic versions of the *GSA LEED® Applications Guide* and the *GSA LEED® Cost Study* are available for downloading from the Whole Building Design Guide (WBDG) Web site at www.wbdg.org. The WBDG is the only knowledge-based Web portal designed to provide government and industry practitioners with one-stop access to up-to-date information on a wide range of federal construction criteria, guidance, and technology from an integrated, or “whole building,” perspective. The WBDG contains an entire design objective branch with a number of resource pages and tools related to sustainability and the LEED® Green Building Rating System.

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Introduction:

GSA LEED Applications Guide

Background & Purpose

The U.S. General Services Administration (GSA) is one of the largest building owners and managers in the nation, responsible for the construction, operation, and maintenance of various federal facilities, including courthouses, office buildings, land ports of entry, and research facilities. In response to federal government mandates (including Executive Order 13123—Greening the Government through Efficient Energy Management), and as a matter of agency policy, GSA actively promotes a value-driven building design process that emphasizes design excellence, user satisfaction, reduced operating costs, and environmental responsibility.

Through the [Facilities Standards for the Public Buildings Service](#) (document PBS–P100, 2003), GSA identifies Sustainability and Energy Performance as basic tenets of their General Design Philosophy. As a means of evaluating and measuring achievements in sustainable design, GSA uses the *Leadership in Energy and Environmental Design* (LEED®) Green Building Rating System of the U.S. Green Building Council. Since fiscal year 2000, GSA has mandated that all of its new construction and major modernization projects attain, at minimum, a LEED Certified rating, while striving for LEED Silver. Certain projects have even achieved a LEED Gold rating.

In support of GSA’s commitment to the LEED program, this *GSA LEED Applications Guide* has been created to assist GSA Project Managers and their design teams in developing focused, value-driven, and cost-effective approaches to meeting GSA’s LEED mandate. This *Applications Guide*, which is a companion document to the [GSA LEED Cost Study](#), outlines an evaluation process in which the predicted first cost impacts of the individual LEED prerequisites and credits (developed from the *Cost Study*) are used as a basis for structuring an overall LEED project approach.

The process also illustrates how LEED criteria relate to existing GSA mandates, performance goals, and programmatic requirements.

While first cost will not be the sole basis for assessing LEED credits and developing a project’s overall “green” goals, the process defined in the *Applications Guide* can assist project teams in separating the no-cost/low-cost “low-hanging fruit” from the moderate and high-cost measures that require more detailed design investigations and cost/benefit analyses. Overall, the *Applications Guide* is intended as a tool to assist project teams in planning and budgeting for LEED in the earliest stages of the design process. By engaging the LEED evaluation process early, project teams have the greatest opportunity to pursue integrated design solutions that can deliver life-cycle cost-effective, environmentally responsible, high-performance buildings.



Figure 1. Nathaniel R. Jones Federal Building and United States Courthouse, Youngstown, Ohio (LEED Certified Rating)
Architect: Robert A.M. Stern Architects

LEED Objectives in GSA Projects

GSA's LEED requirement can be seen as an extension of the agency's previous sustainability initiatives, and as part of GSA's overall efforts to continually improve building quality and performance. As such, it is important that design teams consider LEED as a means to achieve better, more sustainable buildings, rather than as an isolated goal in itself. Project teams should assume that the following goals and objectives apply to all GSA projects:

- 1) LEED measures should be selected to reinforce or support the programmatic, functional, and operational requirements of a project. These basic building requirements should not be compromised by LEED considerations.
- 2) Previously established GSA sustainability requirements (e.g., energy-efficiency targets, use of recycled-content materials) should be achieved and integrated with the corresponding LEED prerequisites or credits.
- 3) LEED credits that can be achieved with relative ease at a "no-cost" or "low-cost" level should typically be pursued, to the extent that such measures provide meaningful benefits to the building occupants and operators, the GSA, the community, or the environment. Meaningful benefits may include (but are not limited to) the following:
 - Reduced operational utility costs (energy, water, sewer)
 - Reduced operational maintenance costs
 - Increased useful life of building systems or equipment
 - Increased property value
 - Increased user satisfaction (potentially resulting in increased productivity, reduced absenteeism)
 - Community improvement
 - Support of local industry/economy
 - Reduced global environmental impacts
 - Enhanced agency profile
 - Accelerated market transformation for "green" products and practices

Appropriate strategies and benefits will typically require review on a project-specific basis.

- 4) Additional LEED credits with moderate-to-high first costs, or that involve significant design challenges, should be evaluated based on the value they add to a project weighed against their first cost implications. Life cycle cost analyses or similar detailed investigations should be performed for measures under serious consideration. Credit synergies and integrated design approaches should be used to maximize the value of the measures pursued, while minimizing their first cost premiums.
- 5) Project teams should not pursue credits simply to achieve a LEED rating. Credits and combinations of credits should be selected based on the benefits they provide, as well as their contribution to an integrated design solution.

Project teams should be able to justify their approach to LEED, including the specific credits pursued and the overall rating level obtained, based on these general parameters in conjunction with the project program, site conditions, and budget. It is the purpose of this *Applications Guide* to assist project teams in developing such an approach.

Structure and Scope of the Applications Guide

The *Applications Guide* is divided into two main sections. Section 1 summarizes the results of the *GSA LEED Cost Study* using a color-coded table that identifies the categorized cost impacts of each LEED prerequisite and credit. The cost categorization is based on the two building models examined in the *Cost Study*, a new mid-rise Federal Courthouse (five stories, 262,000 GSF) and a mid-rise Federal Office Building modernization (nine stories, 306,600 GSF). The table also includes two "projected" cost impact columns for each prerequisite and credit, which identify the general cost expectations to achieve the points in most GSA office/institutional projects (for new construction and modernizations). The table is intended as an initial "roadmap" of potential credit costs, and includes comments on key cost impact variables that apply to a number of the LEED credits.

Section 2 of the Guide defines an eight-step LEED evaluation process based on the credit cost categorizations. The process is designed to focus a project team's review of all 69 LEED credits by establishing a set of "Initial Considerations" (steps 1-5), followed by a set of "Detailed Evaluations" (steps 6-8). The Initial Considerations steps identify the potential "low-hanging fruit" in a GSA project, e.g., credits that are mandated through GSA's existing P100 Standards, or credits that can typically be earned with no-cost or low-cost impacts. The Detailed Evaluations steps identify credits that will typically require moderate-to-high first cost investments. In addition, the Detailed Evaluations address credits with significant impacts on design efforts, as well as potential credit synergies and integrated design issues.

Section 2 uses one of the Courthouse models from the *GSA LEED Cost Study* (specifically the "low-cost" Gold-rated model) to exemplify how the LEED evaluation process can be applied to a GSA project. The LEED evaluation process is illustrated through a series of LEED "Scorecards" (Figure 2) that list all of the available prerequisites and credits in the LEED program, with specific credits highlighted that pertain to the corresponding step in the process. The scorecards utilize the same color-coded cost categorizations as the LEED summary table of Section 1. A blank scorecard is also provided in Appendix A for use by project teams in developing their LEED approach.

Overall, the *Applications Guide* illustrates how the cost impact information from the *GSA LEED Cost Study* can support a LEED evaluation process. The *Guide* purposely provides only brief narratives that focus on the evaluation process itself. The *GSA LEED Cost Study* provides more in-depth evaluations of the individual LEED prerequisites and credits, as well as related LEED calculations and detailed cost estimates that clarify the credit cost categorizations used in the *Applications Guide*. The *Applications Guide* also does not attempt to explain the workings of the LEED rating system itself; it is assumed that users have some familiarity with the LEED credits, and have access to the current LEED Rating System and the latest LEED Reference Guide.

It should be noted that while the *GSA LEED Applications Guide* and the *GSA LEED Cost Study* are based on LEED Version 2.1, the principles and

evaluation process described herein will likely be appropriate and applicable to future versions of the LEED rating system, should the associated credits remain similar. A re-evaluation of the *Applications Guide* and the *Cost Study* would be required if there are significant changes to the LEED rating system.

Intended Users

The *GSA LEED Applications Guide* can be used by GSA project managers, as well as design and construction teams working on GSA projects. For teams that have experience with both GSA standards and LEED, the *Applications Guide* can serve as a tool to quickly confirm the team's projected LEED targets and general cost impact assumptions. For teams that are less familiar with LEED impacts on GSA projects, the *Applications Guide*—in conjunction with the *GSA LEED Cost Study*—can provide guidance and direction in setting a project's initial LEED goals. In either case, the *Applications Guide* is not intended to limit the design team's consideration of sustainable features or strategies to only those applicable to the LEED Green Building Rating System.

9 Total for "GSA Standard" Credits				Possible Points: 69				
Sustainable Sites		Possible Points: 14		Materials & Resources		Possible Points: 13		
Y	Prereq 1	Erosion & Sedimentation Control		Y	Prereq 1	Storage & Collection of Recyclables		
	Credit 1.1	Site Selection	1		Credit 1.1	Building Reuse, Maintain 75% of Existing Shell	1	
	Credit 1.2	Development Density	1		Credit 1.2	Building Reuse, Maintain 100% of Existing Shell	1	
	Credit 1.3	Brownfield Redevelopment	1		Credit 1.3	Building Reuse, Maintain 100% Shell & 50% Non-Shell	1	
	Credit 4.1	Alternative Transportation, Public Transportation Access	1		Credit 2.1	Construction Waste Management, Divert 50%	1	
	Credit 4.2	Alternative Transportation, Bicycle Storage & Changing Rooms	1		Credit 2.2	Construction Waste Management, Divert 75%	1	
	Credit 4.3	Alternative Transportation, Alternative Fuel Refueling Stations	1		Credit 3.1	Resource Reuse, Specify 5%	1	
	Credit 4.4	Alternative Transportation, Parking Capacity	1		Credit 3.2	Resource Reuse, Specify 10%	1	
	Credit 5.1	Reduced Site Disturbance, Protect or Restore Open Space	1		Credit 4.1	Recycled Content, Specify 5% PC + PI	1	
	Credit 5.2	Reduced Site Disturbance, Development Footprint	1		Credit 4.2	Recycled Content, Specify 10% PC + PI	1	
	Credit 6.1	Stormwater Management, Rate and Quantity	1		Credit 5.1	Local/regional Materials, 20% Manufactured Locally	1	
	Credit 6.2	Stormwater Management, Treatment	1		Credit 5.2	Local/regional Materials, of 20% Above, 50% Harvested Locally	1	
	Credit 7.1	Landscape & Exterior Design to Reduce Heat Islands, Non-Roof	1		Credit 6	Rapidly Renewable Materials	1	
	Credit 7.2	Landscape & Exterior Design to Reduce Heat Islands, Roof	1		Credit 7	Certified Wood	1	
	Credit 8	Light Pollution Reduction	1					
1	Water Efficiency		Possible Points: 5	5	Indoor Environmental Quality		Possible Points: 15	
	Credit 1.1	Water Efficient Landscaping, Reduce by 50%	1	Y	Prereq 1	Minimum IAQ Performance		
	Credit 1.2	Water Efficient Landscaping, No Potable Use or No Irrigation	1	Y	Prereq 2	Environmental Tobacco Smoke (ETS) Control		
	Credit 2	Innovative Waterwaster Technologies	1	1	Credit 1	Carbon Dioxide (CO ₂) Monitoring		
1	Credit 3.1	Water Use Reduction, 20% Reduction	1	1	Credit 2	Ventilation Effectiveness		
	Credit 3.2	Water Use Reduction, 30% Reduction	1		Credit 3.1	Construction IAQ Management Plan, During Construction		
					Credit 3.2	Construction IAQ Management Plan, Before Occupancy		
					Credit 4.1	Low-Emitting Materials, Adhesives & Sealants		
					Credit 4.2	Low-Emitting Materials, Paints		
				1	Credit 4.3	Low-Emitting Materials, Carpet	1	
					Credit 4.4	Low-Emitting Materials, Composite Wood		
					Credit 5.1	Indoor Chemical & Pollutant Source Control		
					Credit 6.1	Controllability of Systems, Perimeter		
					Credit 6.2	Controllability of Systems, Non-Perimeter		
					Credit 7.1	Thermal Comfort, Comply with ASHRAE 55-1992		
				1	Credit 7.2	Thermal Comfort, Permanent Monitoring System	1	
					Credit 8.1	Daylight & Views, Daylight 75% of Spaces		
					Credit 8.2	Daylight & Views, Views for 90% of Spaces		
2	Energy & Atmosphere		Possible Points: 17	1	Innovation & Design Process			Possible Points: 5
Y	Prereq 1	Fundamental Building Systems Commissioning		1	Credit 1.1	Innovation in Design, Dedicated Ventilation System	1	
Y	Prereq 2	Minimum Energy Performance			Credit 1.2	Innovation in Design		
1	Credit 6.1	CFC Reduction in HVAC/R Equipment	2		Credit 1.3	Innovation in Design		
1	Credit 1.1	Optimize Energy Performance, 20% New / 20% Existing	2		Credit 1.4	Innovation in Design		
	Credit 1.2	Optimize Energy Performance, 30% New / 20% Existing	2		Credit 2	LEED™ Accredited Professional		
	Credit 1.3	Optimize Energy Performance, 40% New / 30% Existing	2					
	Credit 1.4	Optimize Energy Performance, 50% New / 40% Existing	2					
	Credit 1.5	Optimize Energy Performance, 60% New / 50% Existing	2					
	Credit 2.1	Renewable Energy, 5%	1					
	Credit 2.2	Renewable Energy, 10%	1					
	Credit 2.3	Renewable Energy, 20%	1					
1	Credit 3	Additional Commissioning	1					
	Credit 4	Ozone Depletion	1					
	Credit 5	Measurement & Verification	1					
	Credit 6	Green Power	1					
9 Total for "GSA Standard" Credits				Possible Points: 69				
Certified 20-32 points, Silver 33-38 points, Gold 39-51 points, Platinum 52-69 points								

Note: Credits outlined in Red are considered "High Design Impact" credits.

COST KEY

- Measures that are met based on GSA standards or mandates (no premium)
- Measures with no cost premiums, or with potential cost decreases
- Measures with low cost premiums (<50K for Models from GSA LEED Cost Study)
- Measures with moderate cost premiums (between 50K - 150K for Models from GSA LEED Cost Study)
- Measures with high cost premiums (>150K for Models from GSA LEED Cost Study)
- Measures not applicable to the project
- Measures unlikely to be pursued on typical GSA projects

Figure 2. Sample LEED Scorecard with color-coded cost impacts for selected credits (from Section 2 of the Guide)

Section 1:

Credit Cost Impacts From the GSA LEED Cost Study

Overview

The *GSA LEED Cost Study* was commissioned to review the hard- and soft-cost impacts of achieving LEED ratings for two GSA building types, using GSA's established design standards as the point of comparison.

The two building types examined in the study were:

1. A new mid-rise federal Courthouse (five stories, 262,000 GSF, including 15,000 GSF of underground parking; base construction cost is approximately \$220/GSF)
2. A mid-rise federal Office Building modernization (nine stories, 306,600 GSF, including 40,700 GSF of underground parking; base construction cost is approximately \$130/GSF)

These building types reflect a significant percentage of GSA's planned capital projects over the next five to ten years.

For each of the two building types, baseline construction cost estimates were developed to reflect applicable federal design requirements, as defined in GSA's *Facilities Standards for the Public Buildings Service* (document PBS-P100, 2003), and, for Courthouses, the Administrative Office of the United States Courts' *U. S. Courts Design Guide*. The design standards were also used as the basis for evaluating each LEED prerequisite and credit. An analysis was performed to identify green building measures—above and beyond those included in GSA's standards—that would likely be implemented to meet the specific LEED prerequisite and credit requirements. From these measures, cost impact estimates were developed for each prerequisite and credit, with variations defined for both the Courthouse and Office Building models. The individual credit costs were then categorized, using the following key:

- 1) GSA mandate (no cost)
- 2) No Cost/Potential Cost Decrease
- 3) Low Cost (< \$50K)
- 4) Moderate Cost (\$50K-\$150K)
- 5) High Cost (>\$150K)

From these individual credit assessments, overall project cost estimates were developed for 12 LEED rating “scenarios” (6 for each building type). The scenarios were defined as follows:

- *New Courthouse*. Two estimates were developed at the Certified, Silver, and Gold rating levels. At each rating level, one “low-cost” and one “high-cost” scenario was defined in order to bracket the LEED costs.
- *Office Building Modernization*. Two estimates were developed at the Certified, Silver, and Gold rating levels. At each rating level, one scenario reflected a “minimal façade renovation” (window replacement, minor repairs) and the other reflected a “full façade renovation” (new cladding and façade design, new windows, new insulation). The different façade scenarios reflect one of the most significant scope variations in GSA's modernization projects and were therefore used as the basis for bracketing the LEED Office Building Modernization costs.



Figure 1-1. Social Security Administration Building Renovation, Woodlawn, Maryland. (LEED Certified Rating)
Architect: Whitman Requardt & Associates

The scenarios were validated by comparing them to the LEED scorecards of actual GSA projects. This ensured that the credits selected for each scenario were feasible and achievable in the GSA context. [Appendix C](#) shows a summary of the scorecards for a number of recent GSA LEED projects.

The *GSA LEED Cost Study* therefore provided two key evaluations—the predicted costs of individual LEED prerequisites and credits, and the predicted costs to achieve LEED ratings at the Certified, Silver and Gold rating levels.

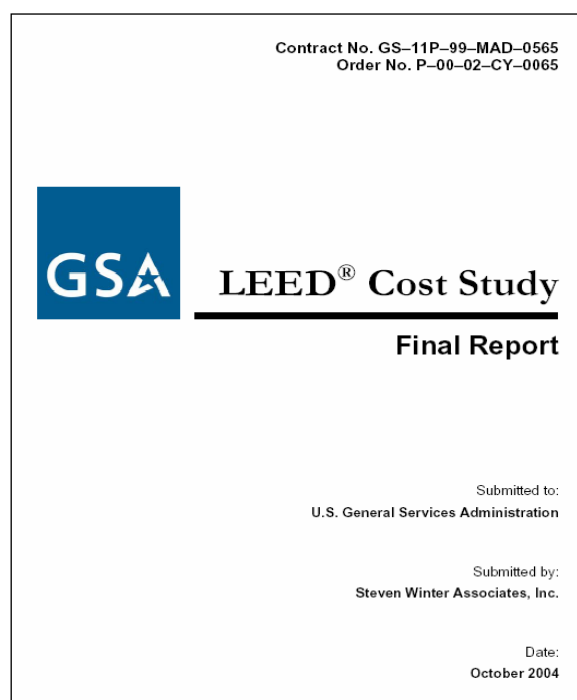


Figure 1-2. GSA LEED® Cost Study, October 2004. This major study for the U.S. General Services Administration evaluates the hard cost and soft cost impacts associated with the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) rating system. Two building types (new construction Courthouse and Federal Office Building modernization) are analyzed at the Certified, Silver, and Gold rating levels.

For the purposes of this *Applications Guide*, it was determined that the data from the *Cost Study* could be used in two significant ways: 1) the prerequisite and credit cost categorizations could provide GSA project teams with a starting point to evaluate potential LEED costs; and 2) the process used to develop the overall LEED ratings in the *Cost Study* could be adapted into a preliminary LEED evaluation process.

Table 1-1 (below) summarizes the prerequisite and credit cost categorizations from the *Cost Study*. The table identifies the range of cost impacts defined for each prerequisite and credit in the New Courthouse and Office Building Modernization scenarios and then projects an expected cost for other GSA office or institutional building types (differentiating new construction and modernization projects). The table is intended as a quick reference for project teams to assess initial LEED costs in the **GSA project context**.

The comments column in **Table 1-1** addresses a key aspect of the cost analysis—the fact that some credits are inherently not applicable to all projects, and the fact that many credits have variable costs that depend on the building type, site, approach to compliance, or other factors. It is incumbent on all GSA project teams to assess the applicability of LEED credits to their specific project and to determine the likely approach that will be taken for credits with highly variable costs. The detailed analyses in the *GSA LEED Cost Study* can act as a useful reference for project teams in making these assessments.

Table 1-1. LEED Credit Cost Impacts (Part 1 of 3)

		IDENTIFIED COST IMPACTS FROM GSA LEED COST STUDY				PROJECTED COST IMPACTS			
		NEW COURTHOUSE		OFFICE BUILDING MODERN'ZTN.		GSA OFFICE OR INSTITUTIONAL BUILDINGS		COMMENTS	
ID#	LEED Prerequisite or Credit	Low	High	Min Fac	Full Fac	New	Mod		
SS SUSTAINABLE SITES (14 Possible Points)									
SS-P1	Erosion and Sedimentation Control	PRE.	PRE.	PRE.	PRE.	PRE.	PRE.		
SS-1	Site Selection	1		1		1	1	Credit may not be available to all GSA projects - depends on specific site.	
SS-2	Development Density	1		1		1	1	Credit may not be available to all GSA projects - depends on specific site.	
SS-3	Brownfield Redevelopment	1				1	1	Brownfield remediation costs are assumed to be outside of the LEED scope, therefore no premium.	
SS-4.1	Alternative Transportation- Public Transportation Access	1	1	1	1	1	1	Credit may not be available to all GSA projects - depends on specific site.	
SS-4.2	Alternative Transportation- Bicycle Storage & Changing Rooms		1	1	1	1	1	Credit costs can be significantly lower if health club (w/showers) is included in building program.	
SS-4.3	Alternative Transportation- Alternative Fuel Vehicles				1	1	1	Applicability of charging stations should be reviewed.	
SS-4.4	Alternative Transportation- Parking Capacity			1	1	1	1	Applicability of carpool spaces should be reviewed.	
SS-5.1	Reduced Site Disturbance- Protect or Restore Open Space	1				1		Credit may not be available to all GSA projects - depends on specific site.	
SS-5.2	Reduced Site Disturbance- Development Footprint	1				1	1	Credit may not be available to all GSA projects - depends on specific site.	
SS-6.1	Stormwater Management- Rate and Quantity	1	1			1	1	Credit costs can vary depending on approach - increased site perviousness versus vegetated roofing system.	
SS-6.2	Stormwater Management- Treatment		1			1		Credit applicability may be limited by maintenance requirements.	
SS-7.1	Heat Island Effect - Non-roof	1	1		1	1	1	Credit costs are based on GSA projects with little or no surface parking.	
SS-7.2	Heat Island Effect - Roof	1	1			1	1	Credit costs can vary depending on approach - Energy Star roofing versus vegetated roofing system.	
SS-8	Light Pollution Reduction	1				1	1	Credit may not be available to all GSA projects - may conflict with security requirements.	
WE WATER EFFICIENCY (5 Possible Points)									
WE-1.1	Water-Efficient Landscaping - Reduce by 50%	1	1			1	1	Credit may not be available to all GSA projects - depends on specific site and landscaping requirements.	
WE-1.2	Water-Efficient Landscaping - No Potable Use or No Irrigation	1				1	1	Credit may not be available to all GSA projects - depends on specific site and landscaping requirements.	
WE-2	Innovative Wastewater Technologies								
WE-3.1	Water Use Reduction- 20% Reduction	1	1	1	1	1	1		
WE-3.2	Water Use Reduction - 30% Reduction	1	1	1	1	1	1		

KEY

	Measures that are met based on GSA standards or mandates (no premium)
	Measures with no cost premiums, or with potential cost decreases
	Measures with low cost premiums (<50K for Models from GSA LEED Cost Study)
	Measures with moderate cost premiums (between 50K - 150K for Models from GSA LEED Cost Study)
	Measures with high cost premiums (>150K for Models from GSA LEED Cost Study)
	Measures with variable cost premiums, depending on project conditions
	Measures not applicable to the project
	Measures unlikely to be pursued on typical GSA projects
	Measures not pursued, although technically viable

Table 1-1. LEED Credit Cost Impacts (Part 2 of 3)

		IDENTIFIED COST IMPACTS FROM GSA LEED COST STUDY				PROJECTED COST IMPACTS		
		NEW COURTHOUSE		OFFICE BUILDING MODERN'ZTN.		GSA OFFICE OR INSTITUTIONAL BUILDINGS		COMMENTS
ID#	LEED Prerequisite or Credit	Low	High	Min Fac	Full Fac	New	Mod	
EA ENERGY AND ATMOSPHERE (17 Possible Points)								
EA-P1	Fundamental Building Systems Commissioning	PRE.	PRE.	PRE.	PRE.	PRE.	PRE.	
EA-P2	Minimum Energy Performance	PRE.	PRE.	PRE.	PRE.	PRE.	PRE.	
EA-P3	CFC Reduction in HVAC&R Equipment	PRE.	PRE.	PRE.	PRE.	PRE.	PRE.	
EA-1	Optimize Energy Performance	1-2	3 or more	1-4	5 or more	1-10	1-10	GSA's required energy efficiency targets will typically earn 1-3 points.
EA-2	Renewable Energy		1	1	1	1	1	
EA-3	Additional Commissioning	1	1	1	1	1	1	
EA-4	Ozone Protection							GSA defines acceptable HVAC refrigerants through the EPA's Significant New Alternatives Policy, which includes HCFC-22.
EA-5	Measurement and Verification	1	1	1	1	1	1	
EA-6	Green Power							This credit is considered an Owner's operating issue, rather than a design team issue.
MATERIALS AND RESOURCES (13 Possible Points)								
MR-P1	Storage and Collection of Recyclables	PRE.	PRE.	PRE.	PRE.	PRE.	PRE.	
MR-1.1	Building Reuse - Maintain 75% of Existing Walls, Floors and Roof			1			1	Credit may not be available to all GSA modernization projects - depends on scope.
MR-1.2	Building Reuse - Maintain 100% of Existing Walls, Floors and Roof			1			1	Credit may not be available to all GSA modernization projects - depends on scope.
MR-1.3	Building Reuse - Maintain 100% Shell/Structure & 50% Non-Shell							
MR-2.1	Construction Waste Management - Divert 50% from Landfill	1	1	1	1	1	1	Credit costs can vary depending on regional recycling infrastructure and contractor's experience level.
MR-2.2	Construction Waste Management - Divert 75% from Landfill	1	1	1		1	1	Credit costs can vary depending on regional recycling infrastructure and contractor's experience level.
MR-3.1	Resource Reuse - 5%							
MR-3.2	Resource Reuse - 10%							
MR-4.1	Recycled Content - 5% (post-consumer + 1/2 post-industrial)	1	1	1	1	1	1	
MR-4.2	Recycled Content - 10% (post-consumer + 1/2 post-industrial)	1	1		1	1	1	Credit costs can vary depending on the availability of recycled content materials in the region.
MR-5.1	Regional Materials - 20% Manufactured Regionally	1	1	1	1	1	1	Credit costs can vary depending on the availability and cost of regionally manufactured products.
MR-5.2	Regional Materials - 50% Extracted Regionally	1		1	1	1	1	Credit costs can vary depending on the availability and cost of regionally extracted or harvested products.
MR-6	Rapidly Renewable Materials							
MR- 7	Certified Wood		1	1	1	1	1	Credit costs can vary depending on the extent of wood items (doors, millwork, casework) included in the project.

KEY

	Measures that are met based on GSA standards or mandates (no premium)
	Measures with no cost premiums, or with potential cost decreases
	Measures with low cost premiums (<50K for Models from GSA LEED Cost Study)
	Measures with moderate cost premiums (between 50K - 150K for Models from GSA LEED Cost Study)
	Measures with high cost premiums (>150K for Models from GSA LEED Cost Study)
	Measures with variable cost premiums, depending on project conditions
	Measures unlikely to be pursued on typical GSA projects
	Measures not applicable to the project
	Measures not pursued, although technically viable

Table 1-1. LEED Credit Cost Impacts (Part 3 of 3)

		IDENTIFIED COST IMPACTS FROM GSA LEED COST STUDY				PROJECTED COST IMPACTS					
		NEW COURTHOUSE		OFFICE BUILDING MODERN'ZTN.		GSA OFFICE OR INSTITUTIONAL BUILDINGS		COMMENTS			
		Low	High	Min Fac	Full Fac	New	Mod				
ID#	LEED Prerequisite or Credit										
EQ INDOOR ENVIRONMENTAL QUALITY (15 Possible Points)											
EQ-P1	Minimum IAQ Performance	PRE.	PRE.	PRE.	PRE.	PRE.	PRE.				
EQ-P2	Environmental Tobacco Smoke (ETS) Control	PRE.	PRE.	PRE.	PRE.	PRE.	PRE.	No cost premium for buildings with a "no smoking" policy.			
EQ-1	Carbon Dioxide Monitoring	1	1	1	1	1	1				
EQ-2	Ventilation Effectiveness	1	1	1	1	1	1				
EQ-3.1	Construction IAQ Management Plan- During Construction	1	1	1	1	1	1				
EQ-3.2	Construction IAQ Management Plan- Before Occupancy	1	1	1	1	1	1				
EQ-4.1	Low-Emitting Materials- Adhesives and Sealants	1	1	1	1	1	1				
EQ-4.2	Low-Emitting Materials- Paints and Coatings	1	1	1	1	1	1				
EQ-4.3	Low-Emitting Materials- Carpet	1	1	1	1	1	1				
EQ-4.4	Low-Emitting Materials- Composite Wood		1	1	1	1	1	Credit costs can vary depending on the extent of engineered wood/agrifiber items (doors, casework) included in the project.			
EQ-5	Indoor Chemical and Pollutant Source Control	1	1	1	1	1	1				
EQ-6.1	Controllability of Systems- Perimeter Spaces			1	1		1	Operable windows unlikely for Courthouses (security issues). Costs can vary for other buildings based on window areas.			
EQ-6.2	Controllability of Systems- Non-Perimeter Spaces	1	1			1		Achievable on projects with underfloor air delivery systems.			
EQ-7.1	Thermal Comfort- Compliance with ASHRAE 55-1992	1	1		1	1	1	Credit costs are primarily for humidification systems. GSA requires humidification in Courthouses, but not other facilities.			
EQ-7.2	Thermal Comfort- Permanent Monitoring System	1	1		1	1	1	Costs for monitoring are assumed to be included as part of Credit EQ-7.1 above.			
EQ-8.1	Daylight and Views- Daylight 75% of Spaces					1	1	Viability and costs can vary depending on building size, site constraints, security requirements and design strategies.			
EQ-8.2	Daylight and Views- Views for 90% of Spaces			1		1	1	Viability and costs can vary depending on building size, site constraints, security requirements and design strategies.			
ID INNOVATION AND DESIGN PROCESS (5 Possible Points)											
ID-1.1	Innovation in Design - Dedicated Ventilation System	1	1	1	1	1	1				
ID-1.2	Innovation in Design - Exceed Local Materials Criteria (40%)	1				1	1	Credit costs can vary depending on the availability and cost of regionally manufactured products.			
ID-1.3	Innovation in Design - Educational Display		1	1	1	1	1				
ID-1.4A	Innovation in Design - Exceed Heat Island Effect, Non-Roof criteria		1			1	1				
ID-1.4B	Innovation in Design - Exceed Certified Wood criteria (75%)		1		1	1	1	Credit costs can vary depending on the extent of wood items (doors, millwork, casework) included in the project.			
ID-2	LEED Accredited Professional	1	1	1	1	1	1				

KEY

	Measures that are met based on GSA standards or mandates (no premium)
	Measures with no cost premiums, or with potential cost decreases
	Measures with low cost premiums (<50K for Models from GSA LEED Cost Study)
	Measures with moderate cost premiums (between 50K - 150K for Models from GSA LEED Cost Study)
	Measures with high cost premiums (>150K for Models from GSA LEED Cost Study)
	Measures with variable cost premiums, depending on project conditions
	Measures not applicable to the project
	Measures unlikely to be pursued on typical GSA projects
	Measures not pursued, although technically viable

Section 2:

LEED Evaluation Process

Process Review

The following section defines an overall process, divided into eight steps, for assessing LEED credits and developing preliminary LEED goals for GSA projects. The process uses the cost impact insights from the *GSA LEED Cost Study* to structure a common sense approach that separates the potential no-cost or low-cost, easily achievable LEED credits from those that have moderate or high potential costs and require more detailed cost/benefit analysis.

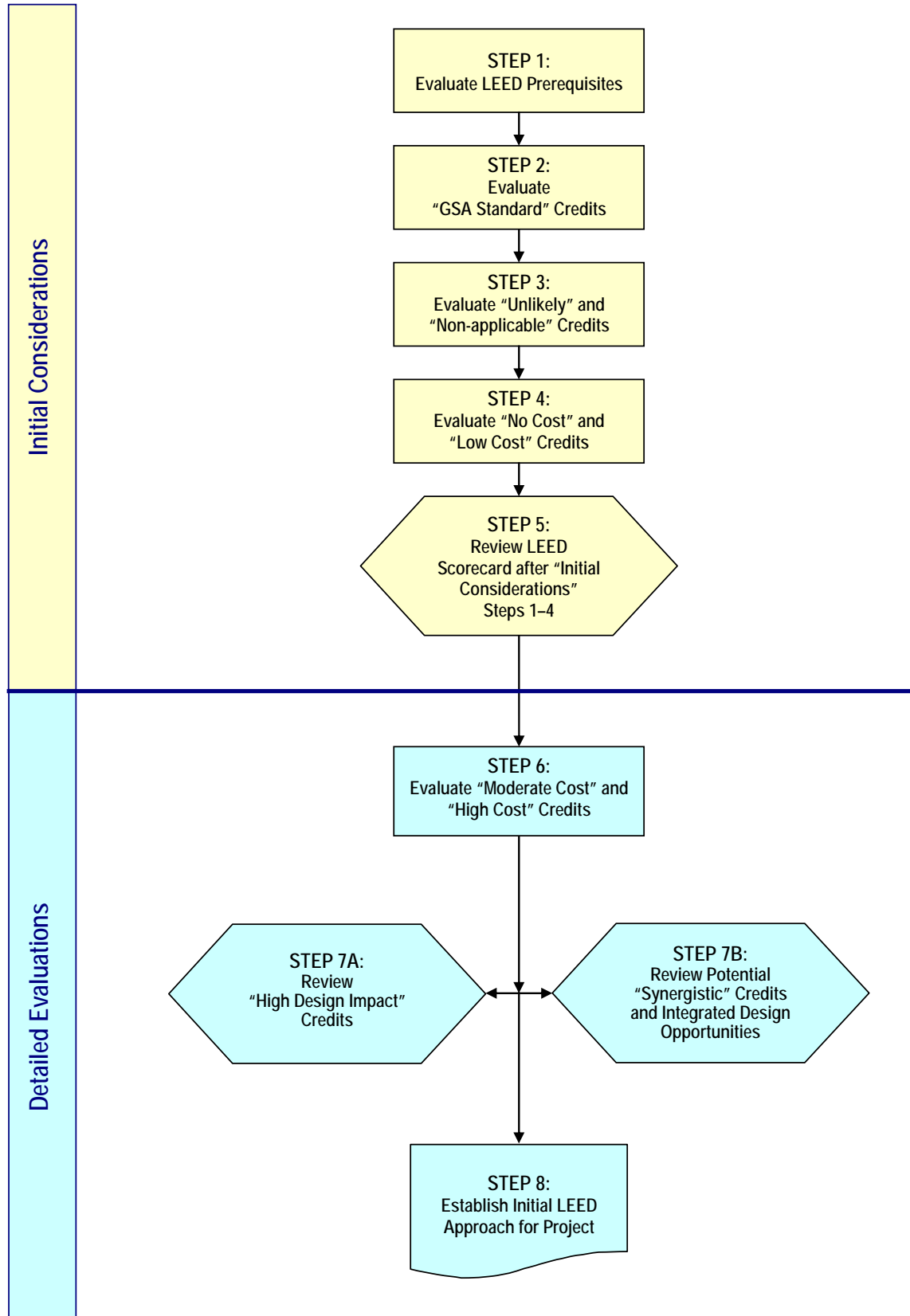
Although the process is structured in eight steps, it is intended as a whole. The eight steps are grouped into two main parts, an “Initial Considerations” stage (steps 1-5), and a “Detailed Evaluations” stage (steps 6-8), to clarify the intent (see figure 2-1). In addition, the descriptions in each step are purposely kept brief, so that the entire process can initially be reviewed in less than an hour.

The LEED Evaluation Process uses one of the Courthouse models from the *GSA LEED Cost Study* (specifically the “low-cost” Gold-rated model) to exemplify how the LEED credits can be evaluated and applied to a GSA project. The process is illustrated through a series of LEED “Scorecards” that list all of the available prerequisites and credits in the LEED program, with specific credits highlighted that pertain to the corresponding step in the process. The scorecards utilize the same color-coded cost categorizations as the LEED summary table of Section 1. In addition, a blank scorecard is provided in [Appendix A](#) for use by GSA project teams.

Overall, the intent of the LEED Evaluation Process is to assist project teams in attaining the highest LEED rating that is reasonable for their project, while also narrowing their focus to those key issues that require immediate attention during the early design phases. The process should be considered a primer on working with LEED in the GSA project context, rather than a rigorous or overly formulaic approach to LEED or green building design.

Project teams are encouraged to visit the Whole Building Design Guide (WBDG) at www.wbdg.org to obtain information and resources on integrated (or ‘whole building’) design, and on the strategies and technologies used to achieve LEED credits. Other web-based resources are listed in [Appendix B](#).

Figure 2-1. LEED Evaluation Process for GSA Projects



Step 1:

Evaluate LEED Prerequisites

The LEED rating system includes seven mandatory prerequisites, which apply to all projects. As such, it is useful for project teams to assess the prerequisites as a first priority in order to determine how compliance will be achieved.

Example

Table 2-1 summarizes the cost impacts identified for each of the seven prerequisites in the “Low-Cost” Gold-rated Courthouse model of the *GSA LEED Cost Study*. As the table indicates, five of the seven prerequisites are expected to be earned at no additional cost due to GSA’s existing design requirements and building commissioning protocols. In addition, the Erosion and Sedimentation Control prerequisite (under the Sustainable Sites category) is expected to be achieved with no cost impact.

The one item identified as having a potential “low cost” impact is EQ Prerequisite 2: Environmental Tobacco Smoke Control. Most GSA projects will achieve this credit at no cost by prohibiting smoking within the building and at the building exterior near entryways, operable windows, or air intakes. GSA standards and Executive Order 13058 do, however, currently allow for smoking rooms in federal facilities (e.g., at Judge’s Chambers in a Courthouse). Per P100, smoking rooms in GSA buildings are to be operated under negative pressure and exhausted directly to the outdoors, which is consistent with LEED requirements. A cost premium is expected, however, to provide tracer gas testing for each designated smoking room—this is a LEED requirement that is not part of the P100 guidelines.

Application to GSA Projects

The cost classifications identified in **Table 2-1** are expected to apply to most GSA projects.



Figure 2-2. Recycling room storage at the U.S. EPA New England Regional Laboratory, Chelmsford, Massachusetts. Dedicated recycling collection and storage areas meeting the LEED Materials and Resources Prerequisite are required through GSA’s P100 Design Standards. (Photo: Don Horn)

Table 2-1. LEED Prerequisites ("Low Cost" Courthouse Model)

7 Prerequisites			Possible Points	69
Sustainable Sites			Possible Points	14
<input checked="" type="checkbox"/>	Prereq 1	Erosion & Sedimentation Control		
<input type="checkbox"/>	Credit 1	Site Selection	1	
<input type="checkbox"/>	Credit 2	Development Density	1	
<input type="checkbox"/>	Credit 3	Brownfield Redevelopment	1	
<input type="checkbox"/>	Credit 4.1	Alternative Transportation, Public Transportation Access	1	
<input type="checkbox"/>	Credit 4.2	Alternative Transportation, Bicycle Storage & Changing Rooms	1	
<input type="checkbox"/>	Credit 4.3	Alternative Transportation, Alternative Fuel Refueling Stations	1	
<input type="checkbox"/>	Credit 4.4	Alternative Transportation, Parking Capacity	1	
<input type="checkbox"/>	Credit 5.1	Reduced Site Disturbance, Protect or Restore Open Space	1	
<input type="checkbox"/>	Credit 5.2	Reduced Site Disturbance, Development Footprint	1	
<input type="checkbox"/>	Credit 6.1	Stormwater Management, Rate and Quantity	1	
<input type="checkbox"/>	Credit 6.2	Stormwater Management, Treatment	1	
<input type="checkbox"/>	Credit 7.1	Landscape & Exterior Design to Reduce Heat Islands, Non-Roof	1	
<input type="checkbox"/>	Credit 7.2	Landscape & Exterior Design to Reduce Heat Islands, Roof	1	
<input type="checkbox"/>	Credit 8	Light Pollution Reduction	1	
Water Efficiency			Possible Points	5
<input type="checkbox"/>	Credit 1.1	Water Efficient Landscaping, Reduce by 50%	1	
<input type="checkbox"/>	Credit 1.2	Water Efficient Landscaping, No Potable Use or No Irrigation	1	
<input type="checkbox"/>	Credit 2	Innovative Wastewater Technologies	1	
<input type="checkbox"/>	Credit 3.1	Water Use Reduction, 20% Reduction	1	
<input type="checkbox"/>	Credit 3.2	Water Use Reduction, 30% Reduction	1	
Energy & Atmosphere			Possible Points	17
<input checked="" type="checkbox"/>	Prereq 1	Fundamental Building Systems Commissioning		
<input checked="" type="checkbox"/>	Prereq 2	Minimum Energy Performance		
<input checked="" type="checkbox"/>	Prereq 3	CFC Reduction in HVAC&R Equipment		
<input type="checkbox"/>	Credit 1.1	Optimize Energy Performance, 20% New / 10% Existing	2	
<input type="checkbox"/>	Credit 1.2	Optimize Energy Performance, 30% New / 20% Existing	2	
<input type="checkbox"/>	Credit 1.3	Optimize Energy Performance, 40% New / 30% Existing	2	
<input type="checkbox"/>	Credit 1.4	Optimize Energy Performance, 50% New / 40% Existing	2	
<input type="checkbox"/>	Credit 1.5	Optimize Energy Performance, 60% New / 50% Existing	2	
<input type="checkbox"/>	Credit 2.1	Renewable Energy, 5%	1	
<input type="checkbox"/>	Credit 2.2	Renewable Energy, 10%	1	
<input type="checkbox"/>	Credit 2.3	Renewable Energy, 20%	1	
<input type="checkbox"/>	Credit 3	Additional Commissioning	1	
<input type="checkbox"/>	Credit 4	Ozone Depletion	1	
<input type="checkbox"/>	Credit 5	Measurement & Verification	1	
<input type="checkbox"/>	Credit 6	Green Power	1	
Materials & Resources			Possible Points	13
<input checked="" type="checkbox"/>	Prereq 1	Storage & Collection of Recyclables		
<input type="checkbox"/>	Credit 1.1	Building Reuse, Maintain 75% of Existing Shell	1	
<input type="checkbox"/>	Credit 1.2	Building Reuse, Maintain 100% of Existing Shell	1	
<input type="checkbox"/>	Credit 1.3	Building Reuse, Maintain 100% Shell & 50% Non-Shell	1	
<input type="checkbox"/>	Credit 2.1	Construction Waste Management, Divert 50%	1	
<input type="checkbox"/>	Credit 2.2	Construction Waste Management, Divert 75%	1	
<input type="checkbox"/>	Credit 3.1	Resource Reuse, Specify 5%	1	
<input type="checkbox"/>	Credit 3.2	Resource Reuse, Specify 10%	1	
<input type="checkbox"/>	Credit 4.1	Recycled Content, Specify 5% PC + PI	1	
<input type="checkbox"/>	Credit 4.2	Recycled Content, Specify 10% PC + PI	1	
<input type="checkbox"/>	Credit 5.1	Local/Regional Materials, 20% Manufactured Locally	1	
<input type="checkbox"/>	Credit 5.2	Local/Regional Materials, of 20% Above, 50% Harvested Locally	1	
<input type="checkbox"/>	Credit 6	Rapidly Renewable Materials	1	
<input type="checkbox"/>	Credit 7	Certified Wood	1	
Indoor Environmental Quality			Possible Points	15
<input checked="" type="checkbox"/>	Prereq 1	Minimum IAQ Performance		
<input checked="" type="checkbox"/>	Prereq 2	Environmental Tobacco Smoke (ETS) Control		
<input type="checkbox"/>	Credit 1	Carbon Dioxide (CO ₂) Monitoring	1	
<input type="checkbox"/>	Credit 2	Ventilation Effectiveness	1	
<input type="checkbox"/>	Credit 3.1	Construction IAQ Management Plan, During Construction	1	
<input type="checkbox"/>	Credit 3.2	Construction IAQ Management Plan, Before Occupancy	1	
<input type="checkbox"/>	Credit 4.1	Low-Emitting Materials, Adhesives & Sealants	1	
<input type="checkbox"/>	Credit 4.2	Low-Emitting Materials, Paints	1	
<input type="checkbox"/>	Credit 4.3	Low-Emitting Materials, Carpet	1	
<input type="checkbox"/>	Credit 4.4	Low-Emitting Materials, Composite Wood	1	
<input type="checkbox"/>	Credit 5	Indoor Chemical & Pollutant Source Control	1	
<input type="checkbox"/>	Credit 6.1	Controllability of Systems, Perimeter	1	
<input type="checkbox"/>	Credit 6.2	Controllability of Systems, Non-Perimeter	1	
<input type="checkbox"/>	Credit 7.1	Thermal Comfort, Comply with ASHRAE 55-1992	1	
<input type="checkbox"/>	Credit 7.2	Thermal Comfort, Permanent Monitoring System	1	
<input type="checkbox"/>	Credit 8.1	Daylight & Views, Daylight 75% of Spaces	1	
<input type="checkbox"/>	Credit 8.2	Daylight & Views, Views for 90% of Spaces	1	
Innovation & Design Process			Possible Points	5
<input type="checkbox"/>	Credit 1.1	Innovation in Design	1	
<input type="checkbox"/>	Credit 1.2	Innovation in Design	1	
<input type="checkbox"/>	Credit 1.3	Innovation in Design	1	
<input type="checkbox"/>	Credit 1.4	Innovation in Design	1	
<input type="checkbox"/>	Credit 2	LEED™ Accredited Professional	1	
7 Prerequisites			Possible Points	69
Certified 26-32 points Silver 33-38 points Gold 39-51 points Platinum 52-69 points				

Cost Key

<input checked="" type="checkbox"/>	Measures that are met based on GSA standards or mandates (no premium)
<input type="checkbox"/>	Measures with no cost premiums, or with potential cost decreases
<input type="checkbox"/>	Measures with low cost premiums (<50K for Models from GSA LEED Cost Study)
<input type="checkbox"/>	Measures with moderate cost premiums (between 50K - 150K for Models from GSA LEED Cost Study)
<input type="checkbox"/>	Measures with high cost premiums (>150K for Models from GSA LEED Cost Study)
<input type="checkbox"/>	Measures not applicable to the project
<input type="checkbox"/>	Measures unlikely to be pursued on typical GSA projects

Step 2:

Evaluate “GSA Standard” Credits

The *Facilities Standards for the Public Buildings Service* (document PBS-P100, 2003) identifies Sustainability and Energy Performance as basic tenets of the GSA’s General Design Philosophy. To support these tenets, P100 includes a number of specific sustainable design requirements, ranging from design features to performance goals to specific building technologies. A number of these P100 design standards meet or exceed the criteria of individual LEED credits, thereby allowing projects to earn the credits with, effectively, no cost premium. In addition to the P100 measures, GSA buildings sometimes include specific programmatic requirements that also coincide with LEED credit criteria. It is therefore important for project teams to both identify (at an early stage) and incorporate the “GSA Standard” credits that apply to their project.

Example

Table 2-2 summarizes the “GSA Standard” credits identified in the “Low-Cost” Gold-rated Courthouse model of the *GSA LEED Cost Study*. It is noteworthy that of the nine credits identified in this example, five have potentially significant design implications, and must therefore be addressed by project teams early in the design process. The design-related issues in this example include:

- The project’s approach to energy-efficiency (Credit EA-1.1)
- The design implications (architectural, mechanical) of an underfloor air delivery system with dedicated ventilation units on each floor (Credits EQ-2, EQ-6.2, and ID-1.1)
- The design implications (particularly to the exterior envelope assemblies) of building-wide humidification (Credit EQ-7.1)

Other GSA-mandated measures, such as water-efficient plumbing fixtures and low-emission carpets, primarily involve material or equipment selection and specification.

Application to GSA Projects

It is expected that most GSA projects will have similar combinations of design-related and selection/specification-related credits in the “GSA Standard” category.



Figure 2-3. GSA’s Facilities Standards for the Public Buildings Service (document PBS-P100, 2003). Includes a number of requirements that directly contribute to LEED credits.

Table 2-2. "GSA Standard" Credits (Low Cost Courthouse Model)

9 Total for "GSA Standard" Credits			Possible Points	69
Sustainable Sites			Possible Points	14
Y	Prereq 1	Erosion & Sedimentation Control		
	Credit 1	Site Selection	1	
	Credit 2	Development Density	1	
	Credit 3	Brownfield Redevelopment	1	
	Credit 4.1	Alternative Transportation, Public Transportation Access	1	
	Credit 4.2	Alternative Transportation, Bicycle Storage & Changing Rooms	1	
	Credit 4.3	Alternative Transportation, Alternative Fuel Refueling Stations	1	
	Credit 4.4	Alternative Transportation, Parking Capacity	1	
	Credit 5.1	Reduced Site Disturbance, Protect or Restore Open Space	1	
	Credit 5.2	Reduced Site Disturbance, Development Footprint	1	
	Credit 6.1	Stormwater Management, Rate and Quantity	1	
	Credit 6.2	Stormwater Management, Treatment	1	
	Credit 7.1	Landscape & Exterior Design to Reduce Heat Islands, Non-Roof	1	
	Credit 7.2	Landscape & Exterior Design to Reduce Heat Islands, Roof	1	
	Credit 8	Light Pollution Reduction	1	
1 Water Efficiency			Possible Points	5
	Credit 1.1	Water Efficient Landscaping, Reduce by 50%	1	
	Credit 1.2	Water Efficient Landscaping, No Potable Use or No Irrigation	1	
	Credit 2	Innovative Wastewater Technologies	1	
1	Credit 3.1	Water Use Reduction, 20% Reduction	1	
	Credit 3.2	Water Use Reduction, 30% Reduction	1	
2 Energy & Atmosphere			Possible Points	17
Y	Prereq 1	Fundamental Building Systems Commissioning		
Y	Prereq 2	Minimum Energy Performance		
Y	Prereq 3	CFC Reduction in HVAC&R Equipment		
1	Credit 1.1	Optimize Energy Performance, 20% New / 10% Existing	2	
	Credit 1.2	Optimize Energy Performance, 30% New / 20% Existing	2	
	Credit 1.3	Optimize Energy Performance, 40% New / 30% Existing	2	
	Credit 1.4	Optimize Energy Performance, 50% New / 40% Existing	2	
	Credit 1.5	Optimize Energy Performance, 60% New / 50% Existing	2	
	Credit 2.1	Renewable Energy, 5%	1	
	Credit 2.2	Renewable Energy, 10%	1	
	Credit 2.3	Renewable Energy, 20%	1	
1	Credit 3	Additional Commissioning	1	
	Credit 4	Ozone Depletion	1	
	Credit 5	Measurement & Verification	1	
	Credit 6	Green Power	1	
Materials & Resources			Possible Points	13
Y	Prereq 1	Storage & Collection of Recyclables		
	Credit 1.1	Building Reuse, Maintain 75% of Existing Shell	1	
	Credit 1.2	Building Reuse, Maintain 100% of Existing Shell	1	
	Credit 1.3	Building Reuse, Maintain 100% Shell & 50% Non-Shell	1	
	Credit 2.1	Construction Waste Management, Divert 50%	1	
	Credit 2.2	Construction Waste Management, Divert 75%	1	
	Credit 3.1	Resource Reuse, Specify 5%	1	
	Credit 3.2	Resource Reuse, Specify 10%	1	
	Credit 4.1	Recycled Content, Specify 5% PC + PI	1	
	Credit 4.2	Recycled Content, Specify 10% PC + PI	1	
	Credit 5.1	Local/Regional Materials, 20% Manufactured Locally	1	
	Credit 5.2	Local/Regional Materials, of 20% Above, 50% Harvested Locally	1	
	Credit 6	Rapidly Renewable Materials	1	
	Credit 7	Certified Wood	1	
5 Indoor Environmental Quality			Possible Points	15
Y	Prereq 1	Minimum IAQ Performance		
Y	Prereq 2	Environmental Tobacco Smoke (ETS) Control		
	Credit 1	Carbon Dioxide (CO ₂) Monitoring	1	
1	Credit 2	Ventilation Effectiveness	1	
	Credit 3.1	Construction IAQ Management Plan, During Construction	1	
	Credit 3.2	Construction IAQ Management Plan, Before Occupancy	1	
	Credit 4.1	Low-Emitting Materials, Adhesives & Sealants	1	
	Credit 4.2	Low-Emitting Materials, Paints	1	
1	Credit 4.3	Low-Emitting Materials, Carpet	1	
	Credit 4.4	Low-Emitting Materials, Composite Wood	1	
	Credit 5	Indoor Chemical & Pollutant Source Control	1	
	Credit 6.1	Controllability of Systems, Perimeter	1	
1	Credit 6.2	Controllability of Systems, Non-Perimeter	1	
1	Credit 7.1	Thermal Comfort, Comply with ASHRAE 55-1992	1	
1	Credit 7.2	Thermal Comfort, Permanent Monitoring System	1	
	Credit 8.1	Daylight & Views, Daylight 75% of Spaces	1	
	Credit 8.2	Daylight & Views, Views for 90% of Spaces	1	
1 Innovation & Design Process			Possible Points	5
1	Credit 1.1	Innovation in Design: Dedicated Ventilation System	1	
	Credit 1.2	Innovation in Design	1	
	Credit 1.3	Innovation in Design	1	
	Credit 1.4	Innovation in Design	1	
	Credit 2	LEED™ Accredited Professional	1	
9 Total for "GSA Standard" Credits			Possible Points	69
Certified 26-32 points Silver 33-38 points Gold 39-51 points Platinum 52-69 points				

Note: Credits outlined in Red are considered "High Design Impact" credits.

Cost Key

	Measures that are met based on GSA standards or mandates (no premium)
	Measures with no cost premiums, or with potential cost decreases
	Measures with low cost premiums (<50K for Models from GSA LEED Cost Study)
	Measures with moderate cost premiums (between 50K - 150K for Models from GSA LEED Cost Study)
	Measures with high cost premiums (>150K for Models from GSA LEED Cost Study)
	Measures not applicable to the project
	Measures unlikely to be pursued on typical GSA projects

Step 3:

Evaluate “Unlikely” and “Non-applicable” Credits

In all LEED projects it is inevitable that some of the available credits will not be applicable. This is due, in part, to the design of the LEED system itself. The rating system includes, for instance, credits targeted to building reuse that do not apply to new construction projects, as well as credits targeted to dense urban sites that will typically be unachievable in suburban or rural settings. Other project variables that can cause credits to become non-applicable to GSA projects include:

- The building type and programmatic requirements (e.g., courthouse vs. office building vs. laboratory, vs. border station)
- The project scope (e.g., exclusion of site renovation and roof replacement in an office modernization scope)
- GSA standards and policies, including those related to facility security

In addition to non-applicable credits, there are often a few LEED credits that a project team will quickly determine are “unlikely” due to first cost impacts, maintenance considerations, or other reasons. To focus the project team’s LEED efforts, it is useful to identify these unlikely and non-applicable credits during the Initial Considerations stage.

Example

Table 2-3 summarizes the 14 unlikely and non-applicable credits identified in the “Low-Cost” Gold-rated Courthouse model of the *GSA LEED Cost Study*. Of the eight non-applicable credits, five are due to GSA-specific issues. For instance, LEED Credit EQ-6.1 (Controllability of Systems, Perimeter) was excluded because the credit requires the installation of operable windows. GSA’s

current security requirements generally prohibit the extensive use of operable windows in a Federal Courthouse. Similarly, Credit SS-4.4 (Alternative Transportation, Parking Capacity) was excluded because carpooling was not considered viable in the Federal Courthouse context (parking spaces and access are only provided for judges, court officers, and others with high security clearance).

An example of an unlikely measure is Credit WE-2 (Innovative Wastewater Technologies). The credit was considered unlikely for the Courthouse due to the expected high initial costs of an on-site wastewater treatment system, which would be difficult to justify economically in an urban site with existing infrastructure.¹

Non-applicable and unlikely credits need to be assessed on a project by project basis, as general credit assumptions may not apply to specific projects. For instance, credit EA-4 (Ozone Depletion) was excluded in the *GSA LEED Cost Study* because GSA defines acceptable HVAC refrigerants through the EPA’s Significant New Alternatives Policy (SNAP). The SNAP refrigerant alternatives include HCFC-123 and HCFC-22, which (at the time of the analysis) did not qualify under the LEED credit criteria. In actual projects, however, it is possible to install HVAC equipment that will comply with the credit requirements. As another example, credit EA-6 (Green Power) was categorized as non-applicable because it was considered an operational issue outside the scope of the *GSA LEED Cost Study*. In actuality, some GSA regions do purchase green power, which could potentially be attributed to a LEED project to meet the Green Power credit requirements.

¹ The credit, however, might be feasible for buildings located on remote sites, such as some of GSA’s Land Port of Entry (Border Station) projects.

Application to GSA Projects

It is expected that all GSA projects will have similar issues that will cause certain credits to be categorized as non-applicable or unlikely. Project teams should be careful, however, not to rule out credits or strategies before they have been given adequate consideration within an integrated design approach (as described in step 7). In some cases, it comes down to a matter of choice and availability. For example, although GSA does not exclude HCFC refrigerants, project teams can specify HVAC, refrigeration, and fire suppression systems that do not contain HCFCs or Halons to meet the requirements of Credit EA-4 (Ozone Depletion). Likewise, where GSA is already purchasing green power, it is a matter of verifying the Green-e certification required under LEED, and applying it toward the specific LEED project to meet the requirements of Credit EA-6 (Green Power).










Figure 2-4. U.S. EPA New England Regional Laboratory, Chelmsford, Massachusetts (LEED Gold Rating, Version 1.0)
Wind-powered electricity from Vermont and New York was purchased by EPA to match the electrical consumption of the new facility, enabling achievement of a LEED credit for green power (Credit EA-6, Green Power).
(Photo: Don Horn)

Table 2-3. "Unlikely" or "Non-applicable" Credits ("Low Cost" Courthouse Model)

14 Total for "Unlikley" or "Non-Applicable" Credits			Possible Points	69
2 Sustainable Sites			Possible Points	14
<input type="checkbox"/>	Prereq 1	Erosion & Sedimentation Control		
<input type="checkbox"/>	Credit 1	Site Selection	1	
<input type="checkbox"/>	Credit 2	Development Density	1	
<input type="checkbox"/>	Credit 3	Brownfield Redevelopment	1	
<input type="checkbox"/>	Credit 4.1	Alternative Transportation, Public Transportation Access	1	
<input type="checkbox"/>	Credit 4.2	Alternative Transportation, Bicycle Storage & Changing Rooms	1	
<input checked="" type="checkbox"/>	Credit 4.3	Alternative Transportation, Alternative Fuel Refueling Stations	1	
<input checked="" type="checkbox"/>	Credit 4.4	Alternative Transportation, Parking Capacity	1	
<input type="checkbox"/>	Credit 5.1	Reduced Site Disturbance, Protect or Restore Open Space	1	
<input type="checkbox"/>	Credit 5.2	Reduced Site Disturbance, Development Footprint	1	
<input type="checkbox"/>	Credit 6.1	Stormwater Management, Rate and Quantity	1	
<input type="checkbox"/>	Credit 6.2	Stormwater Management, Treatment	1	
<input type="checkbox"/>	Credit 7.1	Landscape & Exterior Design to Reduce Heat Islands, Non-Roof	1	
<input type="checkbox"/>	Credit 7.2	Landscape & Exterior Design to Reduce Heat Islands, Roof	1	
<input type="checkbox"/>	Credit 8	Light Pollution Reduction	1	
1 Water Efficiency			Possible Points	5
<input type="checkbox"/>	Credit 1.1	Water Efficient Landscaping, Reduce by 50%	1	
<input type="checkbox"/>	Credit 1.2	Water Efficient Landscaping, No Potable Use or No Irrigation	1	
<input checked="" type="checkbox"/>	Credit 2	Innovative Wastewater Technologies	1	
<input type="checkbox"/>	Credit 3.1	Water Use Reduction, 20% Reduction	1	
<input type="checkbox"/>	Credit 3.2	Water Use Reduction, 30% Reduction	1	
4 Energy & Atmosphere			Possible Points	17
<input type="checkbox"/>	Prereq 1	Fundamental Building Systems Commissioning		
<input type="checkbox"/>	Prereq 2	Minimum Energy Performance		
<input type="checkbox"/>	Prereq 3	CFC Reduction in HVAC&R Equipment		
<input type="checkbox"/>	Credit 1.1	Optimize Energy Performance, 20% New / 10% Existing	2	
<input type="checkbox"/>	Credit 1.2	Optimize Energy Performance, 30% New / 20% Existing	2	
<input type="checkbox"/>	Credit 1.3	Optimize Energy Performance, 40% New / 30% Existing	2	
<input type="checkbox"/>	Credit 1.4	Optimize Energy Performance, 50% New / 40% Existing	2	
<input type="checkbox"/>	Credit 1.5	Optimize Energy Performance, 60% New / 50% Existing	2	
<input type="checkbox"/>	Credit 2.1	Renewable Energy, 5%	1	
<input checked="" type="checkbox"/>	Credit 2.2	Renewable Energy, 10%	1	
<input checked="" type="checkbox"/>	Credit 2.3	Renewable Energy, 20%	1	
<input type="checkbox"/>	Credit 3	Additional Commissioning	1	
<input checked="" type="checkbox"/>	Credit 4	Ozone Depletion	1	
<input type="checkbox"/>	Credit 5	Measurement & Verification	1	
<input checked="" type="checkbox"/>	Credit 6	Green Power	1	
6 Materials & Resources			Possible Points	13
<input type="checkbox"/>	Prereq 1	Storage & Collection of Recyclables		
<input checked="" type="checkbox"/>	Credit 1.1	Building Reuse, Maintain 75% of Existing Shell	1	
<input checked="" type="checkbox"/>	Credit 1.2	Building Reuse, Maintain 100% of Existing Shell	1	
<input checked="" type="checkbox"/>	Credit 1.3	Building Reuse, Maintain 100% Shell & 50% Non-Shell	1	
<input type="checkbox"/>	Credit 2.1	Construction Waste Management, Divert 50%	1	
<input type="checkbox"/>	Credit 2.2	Construction Waste Management, Divert 75%	1	
<input checked="" type="checkbox"/>	Credit 3.1	Resource Reuse, Specify 5%	1	
<input checked="" type="checkbox"/>	Credit 3.2	Resource Reuse, Specify 10%	1	
<input type="checkbox"/>	Credit 4.1	Recycled Content, Specify 5% PC + PI	1	
<input type="checkbox"/>	Credit 4.2	Recycled Content, Specify 10% PC + PI	1	
<input type="checkbox"/>	Credit 5.1	Local/Regional Materials, 20% Manufactured Locally	1	
<input type="checkbox"/>	Credit 5.2	Local/Regional Materials, of 20% Above, 50% Harvested Locally	1	
<input checked="" type="checkbox"/>	Credit 6	Rapidly Renewable Materials	1	
<input type="checkbox"/>	Credit 7	Certified Wood	1	
1 Indoor Environmental Quality			Possible Points	15
<input type="checkbox"/>	Prereq 1	Minimum IAQ Performance		
<input type="checkbox"/>	Prereq 2	Environmental Tobacco Smoke (ETS) Control		
<input type="checkbox"/>	Credit 1	Carbon Dioxide (CO ₂) Monitoring	1	
<input type="checkbox"/>	Credit 2	Ventilation Effectiveness	1	
<input type="checkbox"/>	Credit 3.1	Construction IAQ Management Plan, During Construction	1	
<input type="checkbox"/>	Credit 3.2	Construction IAQ Management Plan, Before Occupancy	1	
<input type="checkbox"/>	Credit 4.1	Low-Emitting Materials, Adhesives & Sealants	1	
<input type="checkbox"/>	Credit 4.2	Low-Emitting Materials, Paints	1	
<input type="checkbox"/>	Credit 4.3	Low-Emitting Materials, Carpet	1	
<input type="checkbox"/>	Credit 4.4	Low-Emitting Materials, Composite Wood	1	
<input type="checkbox"/>	Credit 5	Indoor Chemical & Pollutant Source Control	1	
<input checked="" type="checkbox"/>	Credit 6.1	Controllability of Systems, Perimeter	1	
<input type="checkbox"/>	Credit 6.2	Controllability of Systems, Non-Perimeter	1	
<input type="checkbox"/>	Credit 7.1	Thermal Comfort, Comply with ASHRAE 55-1992	1	
<input type="checkbox"/>	Credit 7.2	Thermal Comfort, Permanent Monitoring System	1	
<input type="checkbox"/>	Credit 8.1	Daylight & Views, Daylight 75% of Spaces	1	
<input type="checkbox"/>	Credit 8.2	Daylight & Views, Views for 90% of Spaces	1	
Innovation & Design Process			Possible Points	5
<input type="checkbox"/>	Credit 1.1	Innovation in Design	1	
<input type="checkbox"/>	Credit 1.2	Innovation in Design	1	
<input type="checkbox"/>	Credit 1.3	Innovation in Design	1	
<input type="checkbox"/>	Credit 1.4	Innovation in Design	1	
<input type="checkbox"/>	Credit 2	LEED™ Accredited Professional	1	
14 Total for "Unlikley" or "Non-Applicable" Credits			Possible Points	69
Certified 26-32 points Silver 33-38 points Gold 39-51 points Platinum 52-69 points				

Cost Key

	Measures that are met based on GSA standards or mandates (no premium)
	Measures with no cost premiums, or with potential cost decreases
	Measures with low cost premiums (<50K for Models from GSA LEED Cost Study)
	Measures with moderate cost premiums (between 50K - 150K for Models from GSA LEED Cost Study)
	Measures with high cost premiums (>150K for Models from GSA LEED Cost Study)
	Measures not applicable to the project
	Measures unlikely to be pursued on typical GSA projects

Step 4:

Evaluate “No-Cost” and “Low-Cost” Credits

In most GSA projects, there will be a number of LEED credits that can be achieved with no construction cost impact, even though the credit requirements are not specifically part of GSA’s design standards. A few of the LEED credits may even result in reduced first costs. In addition, the models examined in the *GSA LEED Cost Study* revealed that a number of other LEED credits can be achieved with “low” construction cost impacts². These “no-cost” and “low-cost” credits present significant opportunities to project teams. As such, they should be identified and planned for early in the design process.

Example

Table 2-4 summarizes the “no-cost” and “low-cost” credits identified in the “Low-Cost” Gold-rated Courthouse model of the *GSA LEED Cost Study*. The no-cost/low-cost categorization of these credits can generally be accounted for as follows:

- 1) *Advantageous Site*. On many LEED projects, the characteristics of the project site can earn credits in the Sustainable Sites category with no- or low-cost impacts. In the Courthouse model, for instance, the building is assumed to be located in a downtown urban location, with ample access to public transit. This earns the project Credits SS-1 (Site Selection), SS-2 (Development Density) and SS-4.1 (Alternative Transportation, Public Transportation Access). As with many of GSA’s new Courthouse projects, the model is also assumed to be built on a previously developed site, with some site remediation required. This earns Credit SS-3 (Brownfield Redevelopment) at no-cost premium, as the remediation is considered a

² In the *GSA LEED Cost Study*, the “low-cost” category was defined for credits that had a construction cost premium under \$50,000. This is based on projects that had baseline constructions costs in the range of \$40-60 million.

general site development cost, not specific to LEED.



Figure 2-5. Alfred A. Arraj U.S. Courthouse, Denver, Colorado. GSA buildings are typically located in urban settings, facilitating achievement of the LEED Sustainable Site Credit 2: Development Density at no cost. (Photo: Don Horn)

- 2) *No-Cost/Low-Cost Design Opportunities*. A number of LEED credits can potentially be achieved at no or low costs through smart planning and integrated design. In the Courthouse model, for example, three of the Sustainable Sites credits (SS-5.1, SS-5.2, and SS-6.1) can be achieved by limiting the amount of paved area on the site and by planting native and adaptive plant species for the majority of the landscaping. Using native, adaptive plant species can also eliminate the need for permanent irrigation systems and earn Credits WE-1.1 and WE-1.2. Design integration can

achieve all five of the credits mentioned above within a comprehensive landscaping scheme. The resulting design does not necessarily add a project premium—in fact, in the Courthouse model it actually reduced the overall site development costs.



Figures 2-6 and 2-7. Landscaping at the Alfred A. Arraj U.S. Courthouse, Denver, Colorado. A comprehensive landscaping scheme using native and adapted plant species, minimal paved areas, and no permanent irrigation can reduce overall development costs. (Photo: Don Horn)

Design opportunities were also identified for energy efficiency (Credit EA-1) and exterior lighting design (Credit SS-8), which allowed the Courthouse to earn additional points at no cost increase.

- 3) *Market Transformation of Materials and Equipment.* The growing demand for high-performance buildings has led a number of product manufacturers to increase their “green” material and equipment offerings. Over time, many of these products have become cost competitive with comparable “standard” products. Because of these developments, LEED credits such as SS-7.1 (Heat Island Reduction – Energy Star Roofing), EQ-4.1 (Low-emission Adhesives and Sealants), EQ-4.2 (Low-emission Paints) and MR-4.1/4.2 (Recycled Content Materials) can often be achieved at no- or low-cost premiums.

Application to GSA Projects

Similar “no-cost” and “low-cost” credit opportunities are expected to apply to most GSA building types and projects.

Table 2-4. "No-Cost" and "Low-Cost" Credits

26 Total for "No Cost" and "Low Cost" Credits				Possible Points 69	
10 Sustainable Sites				Possible Points 14	
Y	Prereq 1	Erosion & Sedimentation Control			
1	Credit 1	Site Selection	1		
1	Credit 2	Development Density	1		
1	Credit 3	Brownfield Redevelopment	1		
1	Credit 4.1	Alternative Transportation, Public Transportation Access	1		
	Credit 4.2	Alternative Transportation, Bicycle Storage & Changing Rooms	1		
	Credit 4.3	Alternative Transportation, Alternative Fuel Refueling Stations	1		
	Credit 4.4	Alternative Transportation, Parking Capacity	1		
1	Credit 5.1	Reduced Site Disturbance, Protect or Restore Open Space	1		
1	Credit 5.2	Reduced Site Disturbance, Development Footprint	1		
1	Credit 6.1	Stormwater Management, Rate and Quantity	1		
	Credit 6.2	Stormwater Management, Treatment	1		
1	Credit 7.1	Landscape & Exterior Design to Reduce Heat Islands, Non-Roof	1		
1	Credit 7.2	Landscape & Exterior Design to Reduce Heat Islands, Roof	1		
1	Credit 8	Light Pollution Reduction	1		
2 Water Efficiency				Possible Points 5	
1	Credit 1.1	Water Efficient Landscaping, Reduce by 50%	1		
1	Credit 1.2	Water Efficient Landscaping, No Potable Use or No Irrigation	1		
	Credit 2	Innovative Wastewater Technologies	1		
	Credit 3.1	Water Use Reduction, 20% Reduction	1		
	Credit 3.2	Water Use Reduction, 30% Reduction	1		
1 Energy & Atmosphere				Possible Points 17	
Y	Prereq 1	Fundamental Building Systems Commissioning			
Y	Prereq 2	Minimum Energy Performance			
Y	Prereq 3	CFC Reduction in HVAC&R Equipment			
1	Credit 1.1	Optimize Energy Performance, 20% New / 10% Existing	2		
	Credit 1.2	Optimize Energy Performance, 30% New / 20% Existing	2		
	Credit 1.3	Optimize Energy Performance, 40% New / 30% Existing	2		
	Credit 1.4	Optimize Energy Performance, 50% New / 40% Existing	2		
	Credit 1.5	Optimize Energy Performance, 60% New / 50% Existing	2		
	Credit 2.1	Renewable Energy, 5%	1		
	Credit 2.2	Renewable Energy, 10%	1		
	Credit 2.3	Renewable Energy, 20%	1		
	Credit 3	Additional Commissioning	1		
	Credit 4	Ozone Depletion	1		
	Credit 5	Measurement & Verification	1		
	Credit 6	Green Power	1		
6 Materials & Resources				Possible Points 13	
Y	Prereq 1	Storage & Collection of Recyclables			
	Credit 1.1	Building Reuse, Maintain 75% of Existing Shell	1		
	Credit 1.2	Building Reuse, Maintain 100% of Existing Shell	1		
	Credit 1.3	Building Reuse, Maintain 100% Shell & 50% Non-Shell	1		
1	Credit 2.1	Construction Waste Management, Divert 50%	1		
1	Credit 2.2	Construction Waste Management, Divert 75%	1		
	Credit 3.1	Resource Reuse, Specify 5%	1		
	Credit 3.2	Resource Reuse, Specify 10%	1		
1	Credit 4.1	Recycled Content, Specify 5% PC + PI	1		
1	Credit 4.2	Recycled Content, Specify 10% PC + PI	1		
1	Credit 5.1	Local/Regional Materials, 20% Manufactured Locally	1		
1	Credit 5.2	Local/Regional Materials, of 20% Above, 50% Harvested Locally	1		
	Credit 6	Rapidly Renewable Materials	1		
	Credit 7	Certified Wood	1		
5 Indoor Environmental Quality				Possible Points 15	
Y	Prereq 1	Minimum IAQ Performance			
Y	Prereq 2	Environmental Tobacco Smoke (ETS) Control			
	Credit 1	Carbon Dioxide (CO ₂) Monitoring	1		
	Credit 2	Ventilation Effectiveness	1		
1	Credit 3.1	Construction IAQ Management Plan, During Construction	1		
1	Credit 3.2	Construction IAQ Management Plan, Before Occupancy	1		
1	Credit 4.1	Low-Emitting Materials, Adhesives & Sealants	1		
1	Credit 4.2	Low-Emitting Materials, Paints	1		
	Credit 4.3	Low-Emitting Materials, Carpet	1		
	Credit 4.4	Low-Emitting Materials, Composite Wood	1		
1	Credit 5	Indoor Chemical & Pollutant Source Control	1		
	Credit 6.1	Controllability of Systems, Perimeter	1		
	Credit 6.2	Controllability of Systems, Non-Perimeter	1		
	Credit 7.1	Thermal Comfort, Comply with ASHRAE 55-1992	1		
	Credit 7.2	Thermal Comfort, Permanent Monitoring System	1		
	Credit 8.1	Daylight & Views, Daylight 75% of Spaces	1		
	Credit 8.2	Daylight & Views, Views for 90% of Spaces	1		
2 Innovation & Design Process				Possible Points 5	
1	Credit 1.1	Innovation in Design: Surpassing Local Materials (40%)	1		
	Credit 1.2	Innovation in Design	1		
	Credit 1.3	Innovation in Design	1		
	Credit 1.4	Innovation in Design	1		
1	Credit 2	LEED™ Accredited Professional	1		
26 Total for "No Cost" and "Low Cost" Credits				Possible Points 69	
Certified 26-32 points Silver 33-38 points Gold 39-51 points Platinum 52-69 points					

Note: Credits outlined in Red are considered "High Design Impact" credits.

Cost Key

	Measures that are met based on GSA standards or mandates (no premium)
	Measures with no cost premiums, or with potential cost decreases
	Measures with low cost premiums (<50K for Models from GSA LEED Cost Study)
	Measures with moderate cost premiums (between 50K - 150K for Models from GSA LEED Cost Study)
	Measures with high cost premiums (>150K for Models from GSA LEED Cost Study)
	Measures not applicable to the project
	Measures unlikely to be pursued on typical GSA projects

Step 5:

Review LEED Scorecard after “Initial Considerations” (Steps 1–4)

The number of LEED credits that can be addressed through the “Initial Considerations” steps is not insignificant. As such, upon completion of Steps 1 through 4, the project team should review the status of the LEED scorecard. It may be determined at this stage that a LEED rating is already obtainable, or that a higher rating level is within reach. Alternately, the review will indicate the additional challenges (and potential cost impacts) required to reach the desired rating level.

Example

In the “Low-Cost” Courthouse model shown in **Table 2-5**, 35 applicable points were identified through the “Initial Considerations” process—enough to achieve a Silver rating. In addition, 14 credits were categorized as “not applicable” or “unlikely.” Therefore, of the 69 available LEED points, 49 were already accounted for before the “moderate” and “high-cost” credits were addressed. Of the 35 points targeted, 11 have potentially significant design impacts, and therefore require early consideration and integration by the project team.

For comparison purposes, the point totals at the “Initial Considerations” stage for the other Gold-rated models from the *GSA LEED Cost Study* were as follows:

- “High-Cost” Courthouse:
22 applicable points,
20 not applicable/unlikely
- “Minimal Façade” Office Modernization:
24 applicable points,
21 not applicable/unlikely
- “Full Façade” Office Modernization:
24 applicable points,
23 not applicable/unlikely

After this “Initial Considerations” status review, the LEED Evaluation process continues with the “Detailed Evaluations” steps (6-8). These steps review the remaining LEED credits and assist project teams in establishing the overall LEED approach and rating target for a project.



Figures 2-8 and 2-9. Department of Transportation Building, Lakewood, Colorado. (LEED Silver Rating)
Architect: Opus Architects & Engineers, Inc

Table 2-5 Summary of “Initial Considerations” Stage (“Low Cost” Courthouse Model)

35 Total for Initial Considerations			Possible Points 69	
10 Sustainable Sites			Possible Points 14	
Y	Prereq 1	Erosion & Sedimentation Control		
1	Credit 1	Site Selection	1	
1	Credit 2	Development Density	1	
1	Credit 3	Brownfield Redevelopment	1	
1	Credit 4.1	Alternative Transportation, Public Transportation Access	1	
	Credit 4.2	Alternative Transportation, Bicycle Storage & Changing Rooms	1	
	Credit 4.3	Alternative Transportation, Alternative Fuel Refueling Stations	1	
	Credit 4.4	Alternative Transportation, Parking Capacity	1	
1	Credit 5.1	Reduced Site Disturbance, Protect or Restore Open Space	1	
1	Credit 5.2	Reduced Site Disturbance, Development Footprint	1	
1	Credit 6.1	Stormwater Management, Rate and Quantity	1	
	Credit 6.2	Stormwater Management, Treatment	1	
1	Credit 7.1	Landscape & Exterior Design to Reduce Heat Islands, Non-Roof	1	
1	Credit 7.2	Landscape & Exterior Design to Reduce Heat Islands, Roof	1	
1	Credit 8	Light Pollution Reduction	1	
3 Water Efficiency			Possible Points 5	
1	Credit 1.1	Water Efficient Landscaping, Reduce by 50%	1	
1	Credit 1.2	Water Efficient Landscaping, No Potable Use or No Irrigation	1	
	Credit 2	Innovative Wastewater Technologies	1	
1	Credit 3.1	Water Use Reduction, 20% Reduction	1	
	Credit 3.2	Water Use Reduction, 30% Reduction	1	
3 Energy & Atmosphere			Possible Points 17	
Y	Prereq 1	Fundamental Building Systems Commissioning		
Y	Prereq 2	Minimum Energy Performance		
Y	Prereq 3	CFC Reduction in HVAC&R Equipment		
2	Credit 1.1	Optimize Energy Performance, 20% New / 10% Existing	2	
	Credit 1.2	Optimize Energy Performance, 30% New / 20% Existing	2	
	Credit 1.3	Optimize Energy Performance, 40% New / 30% Existing	2	
	Credit 1.4	Optimize Energy Performance, 50% New / 40% Existing	2	
	Credit 1.5	Optimize Energy Performance, 60% New / 50% Existing	2	
	Credit 2.1	Renewable Energy, 5%	1	
	Credit 2.2	Renewable Energy, 10%	1	
	Credit 2.3	Renewable Energy, 20%	1	
1	Credit 3	Additional Commissioning	1	
	Credit 4	Ozone Depletion	1	
	Credit 5	Measurement & Verification	1	
	Credit 6	Green Power	1	
6 Materials & Resources			Possible Points 13	
Y	Prereq 1	Storage & Collection of Recyclables		
	Credit 1.1	Building Reuse, Maintain 75% of Existing Shell	1	
	Credit 1.2	Building Reuse, Maintain 100% of Existing Shell	1	
	Credit 1.3	Building Reuse, Maintain 100% Shell & 50% Non-Shell	1	
1	Credit 2.1	Construction Waste Management, Divert 50%	1	
1	Credit 2.2	Construction Waste Management, Divert 75%	1	
	Credit 3.1	Resource Reuse, Specify 5%	1	
	Credit 3.2	Resource Reuse, Specify 10%	1	
1	Credit 4.1	Recycled Content, Specify 5% PC + PI	1	
1	Credit 4.2	Recycled Content, Specify 10% PC + PI	1	
1	Credit 5.1	Local/Regional Materials, 20% Manufactured Locally	1	
1	Credit 5.2	Local/Regional Materials, of 20% Above, 50% Harvested Locally	1	
	Credit 6	Rapidly Renewable Materials	1	
	Credit 7	Certified Wood	1	
10 Indoor Environmental Quality			Possible Points 15	
Y	Prereq 1	Minimum IAQ Performance		
Y	Prereq 2	Environmental Tobacco Smoke (ETS) Control		
	Credit 1	Carbon Dioxide (CO ₂) Monitoring	1	
1	Credit 2	Ventilation Effectiveness	1	
1	Credit 3.1	Construction IAQ Management Plan, During Construction	1	
1	Credit 3.2	Construction IAQ Management Plan, Before Occupancy	1	
1	Credit 4.1	Low-Emitting Materials, Adhesives & Sealants	1	
1	Credit 4.2	Low-Emitting Materials, Paints	1	
1	Credit 4.3	Low-Emitting Materials, Carpet	1	
	Credit 4.4	Low-Emitting Materials, Composite Wood	1	
1	Credit 5	Indoor Chemical & Pollutant Source Control	1	
	Credit 6.1	Controllability of Systems, Perimeter	1	
1	Credit 6.2	Controllability of Systems, Non-Perimeter	1	
1	Credit 7.1	Thermal Comfort, Comply with ASHRAE 55-1992	1	
1	Credit 7.2	Thermal Comfort, Permanent Monitoring System	1	
	Credit 8.1	Daylight & Views, Daylight 75% of Spaces	1	
	Credit 8.2	Daylight & Views, Views for 90% of Spaces	1	
3 Innovation & Design Process			Possible Points 5	
1	Credit 1.1	Innovation in Design: Dedicated Ventilation System	1	
1	Credit 1.2	Innovation in Design: Surpassing Local Materials (40%)	1	
	Credit 1.3	Innovation in Design	1	
	Credit 1.4	Innovation in Design	1	
1	Credit 2	LEED™ Accredited Professional	1	
35 Total for Initial Considerations			Possible Points 69	
Certified 26-32 points Silver 33-38 points Gold 39-51 points Platinum 52-69 points				

Note: Credits outlined in Red are considered “High Design Impact” credits.

Cost Key

	Measures that are met based on GSA standards or mandates (no premium)
	Measures with no cost premiums, or with potential cost decreases
	Measures with low cost premiums (<50K for Models from GSA LEED Cost Study)
	Measures with moderate cost premiums (between 50K - 150K for Models from GSA LEED Cost Study)
	Measures with high cost premiums (>150K for Models from GSA LEED Cost Study)
	Measures not applicable to the project
	Measures unlikely to be pursued on typical GSA projects

Step 6:

Evaluate “Moderate-Cost” and “High-Cost” Credit Options

After completing the “Initial Considerations” steps, project teams will have narrowed down the remaining LEED credits to a more manageable set of “moderate-cost” and “high-cost” credit options. Based on the results of the *GSA LEED Cost Study*, the majority of these higher-cost credits will have one or more of the following characteristics:

- They require additional space, equipment, or materials (e.g., shower rooms, carbon dioxide sensors, photovoltaic panels)
- They involve material or equipment types that are more expensive than “standard” products (e.g., certified wood, vegetated roofing systems, dimmable ballasts for lighting fixtures, high-efficiency chillers)
- They require additional labor or planning (e.g., construction IAQ management, construction waste management)
- They involve sophisticated architectural and/or mechanical design and execution (e.g., quality daylighting design integrated with photocell-based dimming of lighting fixtures)

The moderate- and high-cost credits also tend to have another common characteristic—they can provide significant benefits for the building occupants and building owner, as well as community and environmental benefits. Because both the costs and benefits are potentially high, the pursuit of credits in this category tends to require more thorough and detailed analysis. Issues to consider include the following:

- *Can the high-performance goals directly influence the major architectural, structural, MEP, civil, and landscape design strategies for the building?* By incorporating the green goals into the design parameters, an integrated design solution can be developed that erases or blurs the distinctions between “green” building strategies and the overall project design.

These integrated design solutions can meet multiple goals (programmatic, performance, aesthetic) in the most cost-effective manner. A number of the “High Design Impact” credits in LEED are summarized in step 7 of the *Guide*.



Figure 2-10. Atrium at the U.S. EPA Regional Headquarters, Kansas City, Kansas. The atrium design allows most of the office space in the building to receive natural light. The atrium's glass has a low-emissivity coating to allow visible light to enter while reflecting large percentages of the infrared spectrum, thereby controlling heat gain. (Photo: From [Off the Shelf](#), Koll Development Company)

- *What potential synergies exist between various credits?* Connections among credits should be established to determine how particular design strategies can be used to achieve multiple performance goals, and earn multiple LEED credits. Items that appear costly when applied to only one credit may in fact be justifiable when applied to multiple credits. A number of “Synergistic Credits” are identified in step 7 of the *Guide*.
- *What level of benefit is associated with the credit or group of credits being considered?* In some cases,

the long-term or life cycle benefits of a credit or group of credits can provide clear justification for the first cost investment. Prime benefits to consider include building operational savings (energy, water, sewer, and maintenance costs), which can typically be quantified and evaluated in detail. In addition, worker productivity benefits (resulting from daylighting, views, occupant control, etc.) should be given significant consideration, particularly in the context of GSA's workplace initiatives (e.g., "[The Integrated Workplace](#)" and "[Workplace 20.20](#)" programs).

- *Has money been saved in other areas of the project that can be applied toward the moderate or high cost items?* While the cost of an individual LEED credit may be moderate or high, the overall project budget may support a number of such measures. Through integrated design solutions, trade-offs can occur between reduced project costs (e.g., reduced HVAC equipment sizes, elimination of irrigation systems, elimination of perimeter heating systems) and moderate- or high-cost green measures. Cost trade-offs can benefit from creative thinking—sometimes the most significant trade-offs occur from project-specific conditions that are not initially obvious (e.g., installing a green roof to avoid stormwater detention systems which would otherwise be required by code).

Example

In evaluating moderate and high cost LEED credits, it is important to consider the overall project goals, and the level of the LEED rating being pursued. For example, **Table 2-6** summarizes the “moderate-cost” and “high-cost” credits identified as options for the “Low-Cost” Gold-rated Courthouse model of the *GSA LEED Cost Study*. Since 35 likely credits were already identified in the “Initial Considerations” stages of the LEED evaluation process, only 6 of the 20 credit options identified are necessary to reach the Gold threshold (including 2 extra “insurance” credits). The evaluation process can therefore focus on which 6 of the 20 available points are most beneficial to the overall project, using the assessment considerations noted above and in step 7.










Figure 2-11. Exterior Light Shelves at the U.S. EPA Regional Headquarters, Kansas City, Kansas. The exterior light shelves reflect natural light upward across the interior ceilings, thereby projecting light deeper into the building. The light shelves also help to reduce glare and increase the visual comfort of the interior spaces for the building occupants. (Photo: Don Horn)

Table 2-6. "Moderate-Cost" & "High-Cost" Credit Options ("Low Cost" Courthouse Model)

20 Total for "Moderate Cost" and "High Cost" Credit Options			Possible Points	69
2 Sustainable Sites			Possible Points	14
<input type="checkbox"/>	Prereq 1	Erosion & Sedimentation Control		
<input type="checkbox"/>	Credit 1	Site Selection	1	
<input type="checkbox"/>	Credit 2	Development Density	1	
<input type="checkbox"/>	Credit 3	Brownfield Redevelopment	1	
<input type="checkbox"/>	Credit 4.1	Alternative Transportation, Public Transportation Access	1	
<input checked="" type="checkbox"/>	Credit 4.2	Alternative Transportation, Bicycle Storage & Changing Rooms	1	
<input type="checkbox"/>	Credit 4.3	Alternative Transportation, Alternative Fuel Refueling Stations	1	
<input type="checkbox"/>	Credit 4.4	Alternative Transportation, Parking Capacity	1	
<input type="checkbox"/>	Credit 5.1	Reduced Site Disturbance, Protect or Restore Open Space	1	
<input type="checkbox"/>	Credit 5.2	Reduced Site Disturbance, Development Footprint	1	
<input type="checkbox"/>	Credit 6.1	Stormwater Management, Rate and Quantity	1	
<input checked="" type="checkbox"/>	Credit 6.2	Stormwater Management, Treatment	1	
<input type="checkbox"/>	Credit 7.1	Landscape & Exterior Design to Reduce Heat Islands, Non-Roof	1	
<input type="checkbox"/>	Credit 7.2	Landscape & Exterior Design to Reduce Heat Islands, Roof	1	
<input type="checkbox"/>	Credit 8	Light Pollution Reduction	1	
1 Water Efficiency			Possible Points	5
<input type="checkbox"/>	Credit 1.1	Water Efficient Landscaping, Reduce by 50%	1	
<input type="checkbox"/>	Credit 1.2	Water Efficient Landscaping, No Potable Use or No Irrigation	1	
<input type="checkbox"/>	Credit 2	Innovative Wastewater Technologies	1	
<input type="checkbox"/>	Credit 3.1	Water Use Reduction, 20% Reduction	1	
<input checked="" type="checkbox"/>	Credit 3.2	Water Use Reduction, 30% Reduction	1	
10 Energy & Atmosphere			Possible Points	17
<input checked="" type="checkbox"/>	Prereq 1	Fundamental Building Systems Commissioning		
<input checked="" type="checkbox"/>	Prereq 2	Minimum Energy Performance		
<input checked="" type="checkbox"/>	Prereq 3	CFC Reduction in HVAC&R Equipment		
<input type="checkbox"/>	Credit 1.1	Optimize Energy Performance, 20% New / 10% Existing	2	
<input checked="" type="checkbox"/>	Credit 1.2	Optimize Energy Performance, 30% New / 20% Existing	2	
<input checked="" type="checkbox"/>	Credit 1.3	Optimize Energy Performance, 40% New / 30% Existing	2	
<input checked="" type="checkbox"/>	Credit 1.4	Optimize Energy Performance, 50% New / 40% Existing	2	
<input checked="" type="checkbox"/>	Credit 1.5	Optimize Energy Performance, 60% New / 50% Existing	2	
<input checked="" type="checkbox"/>	Credit 2.1	Renewable Energy, 5%	1	
<input type="checkbox"/>	Credit 2.2	Renewable Energy, 10%	1	
<input type="checkbox"/>	Credit 2.3	Renewable Energy, 20%	1	
<input type="checkbox"/>	Credit 3	Additional Commissioning	1	
<input type="checkbox"/>	Credit 4	Ozone Depletion	1	
<input checked="" type="checkbox"/>	Credit 5	Measurement & Verification	1	
<input type="checkbox"/>	Credit 6	Green Power	1	
1 Materials & Resources			Possible Points	13
<input type="checkbox"/>	Prereq 1	Storage & Collection of Recyclables		
<input type="checkbox"/>	Credit 1.1	Building Reuse, Maintain 75% of Existing Shell	1	
<input type="checkbox"/>	Credit 1.2	Building Reuse, Maintain 100% of Existing Shell	1	
<input type="checkbox"/>	Credit 1.3	Building Reuse, Maintain 100% Shell & 50% Non-Shell	1	
<input type="checkbox"/>	Credit 2.1	Construction Waste Management, Divert 50%	1	
<input type="checkbox"/>	Credit 2.2	Construction Waste Management, Divert 75%	1	
<input type="checkbox"/>	Credit 3.1	Resource Reuse, Specify 5%	1	
<input type="checkbox"/>	Credit 3.2	Resource Reuse, Specify 10%	1	
<input type="checkbox"/>	Credit 4.1	Recycled Content, Specify 5% PC + PI	1	
<input type="checkbox"/>	Credit 4.2	Recycled Content, Specify 10% PC + PI	1	
<input type="checkbox"/>	Credit 5.1	Local/Regional Materials, 20% Manufactured Locally	1	
<input type="checkbox"/>	Credit 5.2	Local/Regional Materials, of 20% Above, 50% Harvested Locally	1	
<input type="checkbox"/>	Credit 6	Rapidly Renewable Materials	1	
<input checked="" type="checkbox"/>	Credit 7	Certified Wood	1	
4 Indoor Environmental Quality			Possible Points	15
<input checked="" type="checkbox"/>	Prereq 1	Minimum IAQ Performance		
<input checked="" type="checkbox"/>	Prereq 2	Environmental Tobacco Smoke (ETS) Control		
<input checked="" type="checkbox"/>	Credit 1	Carbon Dioxide (CO ₂) Monitoring	1	
<input type="checkbox"/>	Credit 2	Ventilation Effectiveness	1	
<input type="checkbox"/>	Credit 3.1	Construction IAQ Management Plan, During Construction	1	
<input type="checkbox"/>	Credit 3.2	Construction IAQ Management Plan, Before Occupancy	1	
<input type="checkbox"/>	Credit 4.1	Low-Emitting Materials, Adhesives & Sealants	1	
<input type="checkbox"/>	Credit 4.2	Low-Emitting Materials, Paints	1	
<input type="checkbox"/>	Credit 4.3	Low-Emitting Materials, Carpet	1	
<input checked="" type="checkbox"/>	Credit 4.4	Low-Emitting Materials, Composite Wood	1	
<input type="checkbox"/>	Credit 5	Indoor Chemical & Pollutant Source Control	1	
<input type="checkbox"/>	Credit 6.1	Controllability of Systems, Perimeter	1	
<input type="checkbox"/>	Credit 6.2	Controllability of Systems, Non-Perimeter	1	
<input type="checkbox"/>	Credit 7.1	Thermal Comfort, Comply with ASHRAE 55-1992	1	
<input type="checkbox"/>	Credit 7.2	Thermal Comfort, Permanent Monitoring System	1	
<input checked="" type="checkbox"/>	Credit 8.1	Daylight & Views, Daylight 75% of Spaces	1	
<input checked="" type="checkbox"/>	Credit 8.2	Daylight & Views, Views for 90% of Spaces	1	
2 Innovation & Design Process			Possible Points	5
<input checked="" type="checkbox"/>	Credit 1.1	Innovation in Design: Exceed Certified Wood Criteria (75%)	1	
<input checked="" type="checkbox"/>	Credit 1.2	Innovation in Design: Exceed Heat Island Effect, Non-roof	1	
<input type="checkbox"/>	Credit 1.3	Innovation in Design	1	
<input type="checkbox"/>	Credit 1.4	Innovation in Design	1	
<input type="checkbox"/>	Credit 2	LEED™ Accredited Professional	1	
20 Total for "Moderate Cost" and "High Cost" Credit Options			Possible Points	69
Certified 26-32 points Silver 33-38 points Gold 39-51 points Platinum 52-69 points				

Note: Credits outlined in Red are considered "High Design Impact" credits.

Cost Key

	Measures that are met based on GSA standards or mandates (no premium)
	Measures with no cost premiums, or with potential cost decreases
	Measures with low cost premiums (<50K for Models from GSA LEED Cost Study)
	Measures with moderate cost premiums (between 50K - 150K for Models from GSA LEED Cost Study)
	Measures with high cost premiums (>150K for Models from GSA LEED Cost Study)
	Measures not applicable to the project
	Measures unlikely to be pursued on typical GSA projects

Step 7:

Evaluate “High Design Impact” Credits and “Synergistic” Credits for Design Integration Opportunities

As noted in Step 6, the selection of moderate- and high-cost LEED credits typically involves detailed evaluations of the costs, benefits, and design implications. Step 7 of the LEED evaluation process focuses on the “High Design Impact” and “Synergistic” credits in a LEED project.

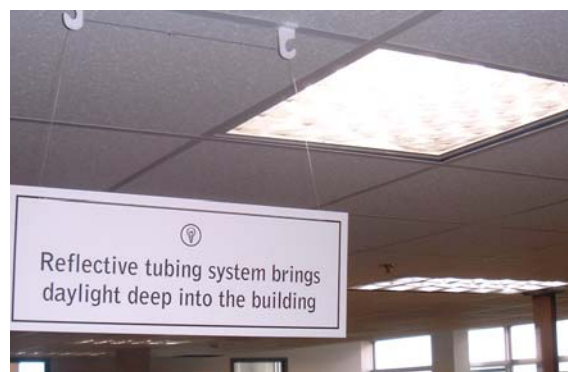
High Design Impact Credits:

Example

Table 2-7a summarizes the “High Design Impact” credits identified as options for the “Low-Cost” Gold-rated Courthouse model of the *GSA LEED Cost Study*. Notably, the credits were identified at various cost impact levels, ranging from no cost to high. The purpose of identifying all of the High Design Impact credits is to establish the level of influence the LEED performance goals may have on the core design approach for a project *before the design is conceptualized*. As illustrated in the Courthouse example, the design impacts of the LEED criteria can be substantial, and may include the following:

- *Site design.* A number of the LEED Sustainable Site credits (particularly the Reduced Site Disturbance and Stormwater Management credits) set criteria that can influence the amount of vegetated or impervious area on a site. This can impact site planting, site paving, and building layout decisions, as well as the basic project approach to stormwater management. Related LEED credits promote native, adaptive, and low-water use plantings (as opposed, for instance, to turf grass), which can further influence a project’s approach to landscaping.
- *Building design.* LEED credits for Daylight and Views can significantly influence the building form, footprint, and façade orientations, as well as the floor-to-ceiling heights, the size

and layout of the fenestration, the use of exterior or interior shading devices and light shelves, and the arrangement of interior spaces. Strategies to reduce energy use, to utilize natural ventilation, or to integrate renewable energy sources (particularly photovoltaic panels) can also significantly affect the basic building form, massing, and approach to fenestration.



Figures 2-12 and 2-13. U.S. EPA New England Regional Laboratory, Chelmsford, Massachusetts (LEED Gold Rating, Version 1.0) Reflective light tubes, with diffusers designed to fit suspended ceiling systems, and exterior light shelves bring daylight deep into the building. (Photo: Don Horn)

- *Building assemblies.* LEED credits to Optimize Energy Performance can influence a project's wall and roof construction assemblies (to minimize heat transfer and air infiltration/exfiltration), as well as a project's glazing selections. In addition, when mechanical humidification is provided to achieve the LEED Thermal Comfort credit, the building envelope must be designed to avoid condensation within the assemblies. In the Courthouse example, the use of an underfloor air distribution system (which contributes to the Ventilation Effectiveness and Controllability of Systems credits) can also influence construction assemblies, as the underfloor plenum must be designed to be airtight.
- *Mechanical systems.* In the Courthouse example, the energy efficiency goals, underfloor air delivery system, and dedicated ventilation system all significantly influence the project approach to HVAC design.



Figure 2-14. Green Roof of National Oceanic and Atmospheric Administration, Suitland, Maryland. Vegetated, or green, roofs can contribute to the reduction of heat islands (LEED Sustainable Site Credit 7.2: Heat Island Reduction – Roof) as well as the reduction of stormwater runoff (LEED Sustainable Site Credit 6.1: Stormwater Management – Rate and Quantity)
Architect: Morphosis (Rendering: Morphosis)

Application to GSA Projects

A number of other major design decisions can be impacted by LEED credit criteria, depending on the specific project and LEED credits under consideration. However, as indicated by the examples in the *GSA LEED Cost Study*, the “High Design Impact” credits in a GSA project will typically be limited to a manageable group. It is important for design teams to establish what these credits are—and their real implications—prior to formulating their design approach.

Credit Synergies:

When reviewing the potential “High Design Impact” credits on a project, it is important that the various design considerations be evaluated in tandem. In some cases the credits will be “synergistic,” meaning that strategies or technologies used to achieve one credit can also be used to achieve additional credits. By evaluating the range of credit synergies within a project, an integrated design solution can be formulated to achieve multiple goals (and earn multiple credits) within a comprehensive and justifiable design approach.

Example

Table 2-7b summarizes the “Synergistic” credit options identified for both the “Low-Cost” and “High-Cost” Gold-rated Courthouse models of the *GSA LEED Cost Study*. As with the “High Design Impact” credits, the synergistic credits were identified at various cost impact levels, ranging from no cost to high. As the table also indicates, credit synergies are not limited to only High Design Impact credits; synergies may also be identified among credits that primarily involve material or equipment selections. Detailed descriptions of credit synergies for the Courthouse models, including the cost implications, can be found in the *GSA LEED Cost Study*.

Table 2-7a. Summary of "High Design Impact" Credits ("Low Cost" Courthouse Model)

20 Total for "High Design Impact" Credits			Possible Points	69
3	Sustainable Sites	Possible Points	14	
	Prereq 1 Erosion & Sedimentation Control			
	Credit 1 Site Selection	1		
	Credit 2 Development Density	1		
	Credit 3 Brownfield Redevelopment	1		
	Credit 4.1 Alternative Transportation, Public Transportation Access	1		
	Credit 4.2 Alternative Transportation, Bicycle Storage & Changing Rooms	1		
	Credit 4.3 Alternative Transportation, Alternative Fuel Refueling Stations	1		
	Credit 4.4 Alternative Transportation, Parking Capacity	1		
1	Credit 5.1 Reduced Site Disturbance, Protect or Restore Open Space	1		
1	Credit 5.2 Reduced Site Disturbance, Development Footprint	1		
1	Credit 6.1 Stormwater Management, Rate and Quantity	1		
	Credit 6.2 Stormwater Management, Treatment	1		
	Credit 7.1 Landscape & Exterior Design to Reduce Heat Islands, Non-Roof	1		
	Credit 7.2 Landscape & Exterior Design to Reduce Heat Islands, Roof	1		
	Credit 8 Light Pollution Reduction	1		
2	Water Efficiency	Possible Points	5	
1	Credit 1.1 Water Efficient Landscaping, Reduce by 50%	1		
1	Credit 1.2 Water Efficient Landscaping, No Potable Use or No Irrigation	1		
	Credit 2 Innovative Wastewater Technologies	1		
	Credit 3.1 Water Use Reduction, 20% Reduction	1		
	Credit 3.2 Water Use Reduction, 30% Reduction	1		
9	Energy & Atmosphere	Possible Points	17	
	Prereq 1 Fundamental Building Systems Commissioning			
	Prereq 2 Minimum Energy Performance			
	Prereq 3 CFC Reduction in HVAC&R Equipment			
	Credit 1.1 Optimize Energy Performance, 20% New / 10% Existing	2		
2	Credit 1.2 Optimize Energy Performance, 30% New / 20% Existing	2		
2	Credit 1.3 Optimize Energy Performance, 40% New / 30% Existing	2		
2	Credit 1.4 Optimize Energy Performance, 50% New / 40% Existing	2		
2	Credit 1.5 Optimize Energy Performance, 60% New / 50% Existing	2		
1	Credit 2.1 Renewable Energy, 5%	1		
	Credit 2.2 Renewable Energy, 10%	1		
	Credit 2.3 Renewable Energy, 20%	1		
	Credit 3 Additional Commissioning	1		
	Credit 4 Ozone Depletion	1		
	Credit 5 Measurement & Verification	1		
	Credit 6 Green Power	1		
5	Materials & Resources	Possible Points	13	
	Prereq 1 Storage & Collection of Recyclables			
	Credit 1.1 Building Reuse, Maintain 75% of Existing Shell	1		
	Credit 1.2 Building Reuse, Maintain 100% of Existing Shell	1		
	Credit 1.3 Building Reuse, Maintain 100% Shell & 50% Non-Shell	1		
	Credit 2.1 Construction Waste Management, Divert 50%	1		
	Credit 2.2 Construction Waste Management, Divert 75%	1		
	Credit 3.1 Resource Reuse, Specify 5%	1		
	Credit 3.2 Resource Reuse, Specify 10%	1		
	Credit 4.1 Recycled Content, Specify 5% PC + PI	1		
	Credit 4.2 Recycled Content, Specify 10% PC + PI	1		
	Credit 5.1 Local/Regional Materials, 20% Manufactured Locally	1		
	Credit 5.2 Local/Regional Materials, of 20% Above, 50% Harvested Locally	1		
	Credit 6 Rapidly Renewable Materials	1		
	Credit 7 Certified Wood	1		
5	Indoor Environmental Quality	Possible Points	15	
	Prereq 1 Minimum IAQ Performance			
	Prereq 2 Environmental Tobacco Smoke (ETS) Control			
	Credit 1 Carbon Dioxide (CO ₂) Monitoring	1		
1	Credit 2 Ventilation Effectiveness	1		
	Credit 3.1 Construction IAQ Management Plan, During Construction	1		
	Credit 3.2 Construction IAQ Management Plan, Before Occupancy	1		
	Credit 4.1 Low-Emitting Materials, Adhesives & Sealants	1		
	Credit 4.2 Low-Emitting Materials, Paints	1		
	Credit 4.3 Low-Emitting Materials, Carpet	1		
	Credit 4.4 Low-Emitting Materials, Composite Wood	1		
	Credit 5 Indoor Chemical & Pollutant Source Control	1		
	Credit 6.1 Controllability of Systems, Perimeter	1		
1	Credit 6.2 Controllability of Systems, Non-Perimeter	1		
1	Credit 7.1 Thermal Comfort, Comply with ASHRAE 55-1992	1		
	Credit 7.2 Thermal Comfort, Permanent Monitoring System	1		
1	Credit 8.1 Daylight & Views, Daylight 75% of Spaces	1		
1	Credit 8.2 Daylight & Views, Views for 90% of Spaces	1		
1	Innovation & Design Process	Possible Points	5	
1	Credit 1.1 Innovation in Design: Dedicated Ventilation System	1		
	Credit 1.2 Innovation in Design	1		
	Credit 1.3 Innovation in Design	1		
	Credit 1.4 Innovation in Design	1		
	Credit 2 LEED™ Accredited Professional	1		
20	Total for "High Design Impact" Credits	Possible Points	69	
Certified 26-32 points Silver 33-38 points Gold 39-51 points Platinum 52-69 points				

Note: Credits outlined in Red are "High Design Impact" credits

Cost Key

	Measures that are met based on GSA standards or mandates (no premium)
	Measures with no cost premiums, or with potential cost decreases
	Measures with low cost premiums (<50K for Models from GSA LEED Cost Study)
	Measures with moderate cost premiums (between 50K - 150K for Models from GSA LEED Cost Study)
	Measures with high cost premiums (>150K for Models from GSA LEED Cost Study)
	Measures not applicable to the project
	Measures unlikely to be pursued on typical GSA projects

Table 2-7b. Examples of "Synergistic" Credit Options (Courthouse Models)

Examples of "Synergistic" Credits		Possible Points	69
Sustainable Sites		Possible Points	14
Prereq 1	Erosion & Sedimentation Control		
Credit 1	Site Selection		
Credit 2	Development Density		
Credit 3	Brownfield Redevelopment		
Credit 4.1	Alternative Transportation, Public Transportation Access		
Credit 4.2	Alternative Transportation, Bicycle Storage & Changing Rooms		
Credit 4.3	Alternative Transportation, Alternative Fuel Refueling Stations		
Credit 4.4	Alternative Transportation, Parking Capacity		
Credit 5.1	Reduced Site Disturbance, Protect or Restore Open Space		
Credit 5.2	Reduced Site Disturbance, Development Footprint		
Credit 6.1	Stormwater Management, Rate and Quantity		
Credit 6.2	Stormwater Management, Treatment		
Credit 7.1	Landscape & Exterior Design to Reduce Heat Islands, Non-Roof		
Credit 7.2	Landscape & Exterior Design to Reduce Heat Islands, Roof		
Credit 8	Light Pollution Reduction		
Water Efficiency		Possible Points	5
Credit 1.1	Water Efficient Landscaping, Reduce by 50%		
Credit 1.2	Water Efficient Landscaping, No Potable Use or No Irrigation		
Credit 2	Innovative Wastewater Technologies		
Credit 3.1	Water Use Reduction, 20% Reduction		
Credit 3.2	Water Use Reduction, 30% Reduction		
Energy & Atmosphere		Possible Points	17
Prereq 1	Fundamental Building Systems Commissioning		
Prereq 2	Minimum Energy Performance		
Prereq 3	CFC Reduction in HVAC&R Equipment		
Credit 1.1	Optimize Energy Performance, 20% New / 10% Existing		
Credit 1.2	Optimize Energy Performance, 30% New / 20% Existing		
Credit 1.3	Optimize Energy Performance, 40% New / 30% Existing		
Credit 1.4	Optimize Energy Performance, 50% New / 40% Existing		
Credit 1.5	Optimize Energy Performance, 60% New / 50% Existing		
Credit 2.1	Renewable Energy, 5%		
Credit 2.2	Renewable Energy, 10%		
Credit 2.3	Renewable Energy, 20%		
Credit 3	Additional Commissioning		
Credit 4	Ozone Depletion		
Credit 5	Measurement & Verification		
Credit 6	Green Power		
Materials & Resources		Possible Points	13
Prereq 1	Storage & Collection of Recyclables		
Credit 1.1	Building Reuse, Maintain 75% of Existing Shell		
Credit 1.2	Building Reuse, Maintain 100% of Existing Shell		
Credit 1.3	Building Reuse, Maintain 100% Shell & 50% Non-Shell		
Credit 2.1	Construction Waste Management, Divert 50%		
Credit 2.2	Construction Waste Management, Divert 75%		
Credit 3.1	Resource Reuse, Specify 5%		
Credit 3.2	Resource Reuse, Specify 10%		
Credit 4.1	Recycled Content, Specify 5% PC + PI		
Credit 4.2	Recycled Content, Specify 10% PC + PI		
Credit 5.1	Local/Regional Materials, 20% Manufactured Locally		
Credit 5.2	Local/Regional Materials, of 20% Above, 50% Harvested Locally		
Credit 6	Rapidly Renewable Materials		
Credit 7	Certified Wood		
Indoor Environmental Quality		Possible Points	15
Prereq 1	Minimum IAQ Performance		
Prereq 2	Environmental Tobacco Smoke (ETS) Control		
Credit 1	Carbon Dioxide (CO ₂) Monitoring		
Credit 2	Ventilation Effectiveness		
Credit 3.1	Construction IAQ Management Plan, During Construction		
Credit 3.2	Construction IAQ Management Plan, Before Occupancy		
Credit 4.1	Low-Emitting Materials, Adhesives & Sealants		
Credit 4.2	Low-Emitting Materials, Paints		
Credit 4.3	Low-Emitting Materials, Carpet		
Credit 4.4	Low-Emitting Materials, Composite Wood		
Credit 5	Indoor Chemical & Pollutant Source Control		
Credit 6.1	Controllability of Systems, Perimeter		
Credit 6.2	Controllability of Systems, Non-Perimeter		
Credit 7.1	Thermal Comfort, Comply with ASHRAE 55-1992		
Credit 7.2	Thermal Comfort, Permanent Monitoring System		
Credit 8.1	Daylight & Views, Daylight 75% of Spaces		
Credit 8.2	Daylight & Views, Views for 90% of Spaces		
Innovation & Design Process		Possible Points	5
Credit 1.1	Innovation in Design: Exceed Certified Wood Criteria (75%)		
Credit 1.2	Innovation in Design		
Credit 1.3	Innovation in Design		
Credit 1.4	Innovation in Design		
Credit 2	LEED™ Accredited Professional		

Note: Credits outlined in Red are considered "high design impact" credits. Blue arrows indicate "synergistic" credits.

Cost Key

	Measures that are met based on GSA standards or mandates (no premium)
	Measures with no cost premiums, or with potential cost decreases
	Measures with low cost premiums (<50K for Models from GSA LEED Cost Study)
	Measures with moderate cost premiums (between 50K - 150K for Models from GSA LEED Cost Study)
	Measures with high cost premiums (>150K for Models from GSA LEED Cost Study)
	Measures not applicable to the project
	Measures unlikely to be pursued on typical GSA projects

Step 8:

Establish Initial LEED Approach for the Project

The preceding seven steps in the LEED Evaluation Process were designed to assist project teams in establishing reasonable LEED targets for GSA projects, based on a cost-justified approach. After establishing the “low-hanging fruit” from the “Initial Considerations” steps, then evaluating and adding additional moderate- or high-cost credits through the “Detailed Evaluations” steps, project teams should have a clear understanding of their targeted LEED credits (and the attended project implications), as well as a defensible justification for the LEED rating level being pursued.

Example

Table 2-8 summarizes the Initial LEED Targets established for the “Low-Cost” Gold-rated Courthouse model of the *GSA LEED Cost Study*. The final tally includes:

- All 7 Prerequisites;
- 9 “GSA Standard” credits (no cost premium);
- 23 “No Cost” credits;
- 3 “Low Cost” credits;
- 3 “Moderate Cost” credits; and
- 3 “High Cost” credits.

As established through the *Cost Study*, the estimated cost premium for achieving the LEED Gold rating is \$2.97/GSF, a 1.4 percent cost increase.

Application to GSA Projects

While other projects may have higher cost impacts, and/or may target a lower LEED rating, the “Low-Cost” Courthouse model demonstrates how the LEED Evaluation Process can be used to set initial green building goals, and achieve a high level of building performance within the programmatic and cost parameters of a GSA project. If approached in this manner, GSA’s LEED rating requirement will achieve its intended goal—to integrate building quality and performance with environmental responsibility and long-term fiscal prudence.

Table 2-8. Summary of Initial LEED Targets ("Low Cost" Courthouse Model)

41 Project Total				Possible Points 69	
10 Sustainable Sites				Possible Points 14	
Y	Prereq 1	Erosion & Sedimentation Control			
1	Credit 1	Site Selection	1		
1	Credit 2	Development Density	1		
1	Credit 3	Brownfield Redevelopment	1		
1	Credit 4.1	Alternative Transportation, Public Transportation Access	1		
	Credit 4.2	Alternative Transportation, Bicycle Storage & Changing Rooms	1		
	Credit 4.3	Alternative Transportation, Alternative Fuel Refueling Stations	1		
	Credit 4.4	Alternative Transportation, Parking Capacity	1		
1	Credit 5.1	Reduced Site Disturbance, Protect or Restore Open Space	1		
1	Credit 5.2	Reduced Site Disturbance, Development Footprint	1		
1	Credit 6.1	Stormwater Management, Rate and Quantity	1		
	Credit 6.2	Stormwater Management, Treatment	1		
1	Credit 7.1	Landscape & Exterior Design to Reduce Heat Islands, Non-Roof	1		
1	Credit 7.2	Landscape & Exterior Design to Reduce Heat Islands, Roof	1		
1	Credit 8	Light Pollution Reduction	1		
4 Water Efficiency				Possible Points 5	
1	Credit 1.1	Water Efficient Landscaping, Reduce by 50%	1		
1	Credit 1.2	Water Efficient Landscaping, No Potable Use or No Irrigation	1		
	Credit 2	Innovative Wastewater Technologies	1		
1	Credit 3.1	Water Use Reduction, 20% Reduction	1		
1	Credit 3.2	Water Use Reduction, 30% Reduction	1		
7 Energy & Atmosphere				Possible Points 17	
Y	Prereq 1	Fundamental Building Systems Commissioning			
Y	Prereq 2	Minimum Energy Performance			
Y	Prereq 3	CFC Reduction in HVAC&R Equipment			
2	Credit 1.1	Optimize Energy Performance, 20% New / 10% Existing	2		
2	Credit 1.2	Optimize Energy Performance, 30% New / 20% Existing	2		
1	Credit 1.3	Optimize Energy Performance, 40% New / 30% Existing	2		
	Credit 1.4	Optimize Energy Performance, 50% New / 40% Existing	2		
	Credit 1.5	Optimize Energy Performance, 60% New / 50% Existing	2		
	Credit 2.1	Renewable Energy, 5%	1		
	Credit 2.2	Renewable Energy, 10%	1		
	Credit 2.3	Renewable Energy, 20%	1		
1	Credit 3	Additional Commissioning	1		
	Credit 4	Ozone Depletion	1		
1	Credit 5	Measurement & Verification	1		
	Credit 6	Green Power	1		
6 Materials & Resources				Possible Points 13	
Y	Prereq 1	Storage & Collection of Recyclables			
	Credit 1.1	Building Reuse, Maintain 75% of Existing Shell	1		
	Credit 1.2	Building Reuse, Maintain 100% of Existing Shell	1		
	Credit 1.3	Building Reuse, Maintain 100% Shell & 50% Non-Shell	1		
1	Credit 2.1	Construction Waste Management, Divert 50%	1		
1	Credit 2.2	Construction Waste Management, Divert 75%	1		
	Credit 3.1	Resource Reuse, Specify 5%	1		
	Credit 3.2	Resource Reuse, Specify 10%	1		
1	Credit 4.1	Recycled Content, Specify 5% PC + PI	1		
1	Credit 4.2	Recycled Content, Specify 10% PC + PI	1		
1	Credit 5.1	Local/Regional Materials, 20% Manufactured Locally	1		
1	Credit 5.2	Local/Regional Materials, of 20% Above, 50% Harvested Locally	1		
	Credit 6	Rapidly Renewable Materials	1		
	Credit 7	Certified Wood	1		
11 Indoor Environmental Quality				Possible Points 15	
Y	Prereq 1	Minimum IAQ Performance			
Y	Prereq 2	Environmental Tobacco Smoke (ETS) Control			
1	Credit 1	Carbon Dioxide (CO ₂) Monitoring	1		
1	Credit 2	Ventilation Effectiveness	1		
1	Credit 3.1	Construction IAQ Management Plan, During Construction	1		
1	Credit 3.2	Construction IAQ Management Plan, Before Occupancy	1		
1	Credit 4.1	Low-Emitting Materials, Adhesives & Sealants	1		
1	Credit 4.2	Low-Emitting Materials, Paints	1		
1	Credit 4.3	Low-Emitting Materials, Carpet	1		
	Credit 4.4	Low-Emitting Materials, Composite Wood	1		
1	Credit 5	Indoor Chemical & Pollutant Source Control	1		
	Credit 6.1	Controllability of Systems, Perimeter	1		
1	Credit 6.2	Controllability of Systems, Non-Perimeter	1		
1	Credit 7.1	Thermal Comfort, Comply with ASHRAE 55-1992	1		
1	Credit 7.2	Thermal Comfort, Permanent Monitoring System	1		
	Credit 8.1	Daylight & Views, Daylight 75% of Spaces	1		
	Credit 8.2	Daylight & Views, Views for 90% of Spaces	1		
3 Innovation & Design Process				Possible Points 5	
1	Credit 1.1	Innovation in Design: Dedicated Ventilation System	1		
1	Credit 1.2	Innovation in Design: Surpassing Local Materials (40%)	1		
	Credit 1.3	Innovation in Design	1		
	Credit 1.4	Innovation in Design	1		
1	Credit 2	LEED™ Accredited Professional	1		
41 Project Total				Possible Points 69	
Certified 26-32 points Silver 33-38 points Gold 39-51 points Platinum 52-69 points					

Note: Credits outlined in Red are considered "high design impact" credits.

Cost Key

	Measures that are met based on GSA standards or mandates (no premium)
	Measures with no cost premiums, or with potential cost decreases
	Measures with low cost premiums (<50K for Models from GSA LEED Cost Study)
	Measures with moderate cost premiums (between 50K - 150K for Models from GSA LEED Cost Study)
	Measures with high cost premiums (>150K for Models from GSA LEED Cost Study)
	Measures not applicable to the project
	Measures unlikely to be pursued on typical GSA projects

Appendix A:

LEED Scorecard for Evaluating GSA Projects

The following LEED Version 2.1 scorecard is provided for use by GSA project teams in developing and evaluating their project's LEED approach. By engaging the LEED evaluation process early—during the programming and design concepts phases—project teams have the greatest opportunity to pursue integrated design solutions that can deliver life-cycle cost-effective, environmentally responsible, high-performance buildings.

LEED Version 2.1 Scorecard				Possible Points 69			
Sustainable Sites			Possible Points 14	Materials & Resources			Possible Points 13
<input type="checkbox"/>	Prereq 1	Erosion & Sedimentation Control	Y	<input type="checkbox"/>	Prereq 1	Storage & Collection of Recyclables	Y
<input type="checkbox"/>	Credit 1	Site Selection	1	<input type="checkbox"/>	Credit 1.1	Building Reuse, Maintain 75% of Existing Shell	1
<input type="checkbox"/>	Credit 2	Development Density	1	<input type="checkbox"/>	Credit 1.2	Building Reuse, Maintain 100% of Existing Shell	1
<input type="checkbox"/>	Credit 3	Brownfield Redevelopment	1	<input type="checkbox"/>	Credit 1.3	Building Reuse, Maintain 100% Shell & 50% Non-Shell	1
<input type="checkbox"/>	Credit 4.1	Alternative Transportation, Public Transportation Access	1	<input type="checkbox"/>	Credit 2.1	Construction Waste Management, Divert 50%	1
<input type="checkbox"/>	Credit 4.2	Alternative Transportation, Bicycle Storage & Changing Rooms	1	<input type="checkbox"/>	Credit 2.2	Construction Waste Management, Divert 75%	1
<input type="checkbox"/>	Credit 4.3	Alternative Transportation, Alternative Fuel Refueling Stations	1	<input type="checkbox"/>	Credit 3.1	Resource Reuse, Specify 5%	1
<input type="checkbox"/>	Credit 4.4	Alternative Transportation, Parking Capacity	1	<input type="checkbox"/>	Credit 3.2	Resource Reuse, Specify 10%	1
<input type="checkbox"/>	Credit 5.1	Reduced Site Disturbance, Protect or Restore Open Space	1	<input type="checkbox"/>	Credit 4.1	Recycled Content, Specify 5% PC + PI	1
<input type="checkbox"/>	Credit 5.2	Reduced Site Disturbance, Development Footprint	1	<input type="checkbox"/>	Credit 4.2	Recycled Content, Specify 10% PC + PI	1
<input type="checkbox"/>	Credit 6.1	Stormwater Management, Rate and Quantity	1	<input type="checkbox"/>	Credit 5.1	Local/Regional Materials, 20% Manufactured Locally	1
<input type="checkbox"/>	Credit 6.2	Stormwater Management, Treatment	1	<input type="checkbox"/>	Credit 5.2	Local/Regional Materials, of 20% Above, 50% Harvested Locally	1
<input type="checkbox"/>	Credit 7.1	Landscape & Exterior Design to Reduce Heat Islands, Non-Roof	1	<input type="checkbox"/>	Credit 6	Rapidly Renewable Materials	1
<input type="checkbox"/>	Credit 7.2	Landscape & Exterior Design to Reduce Heat Islands, Roof	1	<input type="checkbox"/>	Credit 7	Certified Wood	1
<input type="checkbox"/>	Credit 8	Light Pollution Reduction	1				
Water Efficiency			Possible Points 5	Indoor Environmental Quality			Possible Points 15
<input type="checkbox"/>	Credit 1.1	Water Efficient Landscaping, Reduce by 50%	1	<input type="checkbox"/>	Prereq 1	Minimum IAQ Performance	Y
<input type="checkbox"/>	Credit 1.2	Water Efficient Landscaping, No Potable Use or No Irrigation	1	<input type="checkbox"/>	Prereq 2	Environmental Tobacco Smoke (ETS) Control	Y
<input type="checkbox"/>	Credit 2	Innovative Wastewater Technologies	1	<input type="checkbox"/>	Credit 1	Carbon Dioxide (CO ₂) Monitoring	1
<input type="checkbox"/>	Credit 3.1	Water Use Reduction, 20% Reduction	1	<input type="checkbox"/>	Credit 2	Ventilation Effectiveness	1
<input type="checkbox"/>	Credit 3.2	Water Use Reduction, 30% Reduction	1	<input type="checkbox"/>	Credit 3.1	Construction IAQ Management Plan, During Construction	1
				<input type="checkbox"/>	Credit 3.2	Construction IAQ Management Plan, Before Occupancy	1
				<input type="checkbox"/>	Credit 4.1	Low-Emitting Materials, Adhesives & Sealants	1
				<input type="checkbox"/>	Credit 4.2	Low-Emitting Materials, Paints	1
				<input type="checkbox"/>	Credit 4.3	Low-Emitting Materials, Carpet	1
				<input type="checkbox"/>	Credit 4.4	Low-Emitting Materials, Composite Wood	1
				<input type="checkbox"/>	Credit 5	Indoor Chemical & Pollutant Source Control	1
				<input type="checkbox"/>	Credit 6.1	Controllability of Systems, Perimeter	1
				<input type="checkbox"/>	Credit 6.2	Controllability of Systems, Non-Perimeter	1
				<input type="checkbox"/>	Credit 7.1	Thermal Comfort, Comply with ASHRAE 55-1992	1
				<input type="checkbox"/>	Credit 7.2	Thermal Comfort, Permanent Monitoring System	1
				<input type="checkbox"/>	Credit 8.1	Daylight & Views, Daylight 75% of Spaces	1
				<input type="checkbox"/>	Credit 8.2	Daylight & Views, Views for 90% of Spaces	1
Energy & Atmosphere			Possible Points 17	Innovation & Design Process			Possible Points 5
<input type="checkbox"/>	Prereq 1	Fundamental Building Systems Commissioning	Y	<input type="checkbox"/>	Credit 1.1	Innovation in Design	1
<input type="checkbox"/>	Prereq 2	Minimum Energy Performance	Y	<input type="checkbox"/>	Credit 1.2	Innovation in Design	1
<input type="checkbox"/>	Prereq 3	CFC Reduction in HVAC&R Equipment	Y	<input type="checkbox"/>	Credit 1.3	Innovation in Design	1
<input type="checkbox"/>	Credit 1.1	Optimize Energy Performance, 20% New / 10% Existing	2	<input type="checkbox"/>	Credit 1.4	Innovation in Design	1
<input type="checkbox"/>	Credit 1.2	Optimize Energy Performance, 30% New / 20% Existing	2	<input type="checkbox"/>	Credit 2	LEED™ Accredited Professional	1
<input type="checkbox"/>	Credit 1.3	Optimize Energy Performance, 40% New / 30% Existing	2				
<input type="checkbox"/>	Credit 1.4	Optimize Energy Performance, 50% New / 40% Existing	2				
<input type="checkbox"/>	Credit 1.5	Optimize Energy Performance, 60% New / 50% Existing	2				
<input type="checkbox"/>	Credit 2.1	Renewable Energy, 5%	1				
<input type="checkbox"/>	Credit 2.2	Renewable Energy, 10%	1				
<input type="checkbox"/>	Credit 2.3	Renewable Energy, 20%	1				
<input type="checkbox"/>	Credit 3	Additional Commissioning	1				
<input type="checkbox"/>	Credit 4	Ozone Depletion	1				
<input type="checkbox"/>	Credit 5	Measurement & Verification	1				
<input type="checkbox"/>	Credit 6	Green Power	1				
Project Total				Possible Points 69			
Certified 26-32 points Silver 33-38 points Gold 39-51 points Platinum 52-69 points							

Appendix B:

Resources

Organizations, Programs, and Services

U.S. General Services Administration (GSA), Public Buildings Service, Sustainable Design Program

www.gsa.gov/sustainabledesign

GSA is committed to incorporating principles of sustainable design and energy efficiency into all of its building projects. The result is an optimal balance of cost, environmental, societal, and human benefits while meeting the mission and function of the intended facility. GSA's Sustainable Design Program, through its regional Build Green Coordinators, provides technical assistance and support to GSA project teams for integrating sustainable design as seamlessly as possible into the existing design and construction process.

U.S. General Services Administration (GSA), Office of Real Property - Sustainable Development Program

www.gsa.gov/sustainabledevelopment

The Office of Real Property, Sustainable Development Program provides access to tools, publications, presentations, and videos developed by GSA to assist agencies in transforming the way they do business.

U.S. General Services Administration (GSA), Office of Real Property, Integrated Workplace Program

www.gsa.gov/Portal/gsa/ep/channelView.do?pageTypeId=8203&channelPage=%2Fep%2Fchannel%2FgsaOverview.jsp&channelId=-13190

The Integrated Workplace (IW) Program supports GSA's strategic goal to "maintain a world-class workforce and world-class workplace," and provides agencies with information and resources that assist them in developing high-performance workplaces that meet their business needs, are best suited to their employees work functions, and can be readily adapted to accommodate new work practices and strategies with a minimum of expense and delay. The IW website includes access to several GSA publications on the integrated workplace concept, as well as several IW case studies.

U.S. General Services Administration (GSA) Federal Supply Service (FSS)

www.gsa.gov/fss

GSA facilitates the federal acquisition of environmental products and services through the Federal Supply Service.

U.S. Green Building Council (USGBC)

www.usgbc.org

The USGBC consists of a coalition of leaders from across the building industry working to promote buildings that are environmentally responsible, profitable, and healthful places to live and work. USGBC and its members developed the Leadership in Energy and Environmental Design (LEED) Green Building Rating System® as a national consensus-based, market-driven building rating system designed to accelerate the development and implementation of green building practices.

Publications and Websites

U.S. General Services Administration (GSA) LEED® Cost Study, 2004

Available: www.wbdg.org/references/ccbdoc.php?i=280

This major study for GSA defines costs associated with the LEED ratings. Two building types (new construction courthouse and Federal Building modernization) are modeled against two scenarios for each LEED rating (Certification, Silver, Gold), identifying differential costs of construction, design, and documentation/submission requirements.

U.S. General Services Administration (GSA) Facilities Standards for the Public Buildings Service, P100-2003

Available: www.wbdg.org/references/ccbdoc.php?i=275&r=1

The *Facilities Standards for the Public Buildings Service* establishes design standards and criteria for new buildings, major and minor alterations, and work in historic structures for the Public Buildings Service of GSA. This document contains policy and technical criteria to be used in the programming, design, and documentation of GSA buildings.

Leadership in Energy and Environmental Design (LEED) Green Building Rating System®

Available: www.leedbuilding.org

LEED is a voluntary, consensus-based national standard for developing sustainable buildings. LEED® consists of a set of prerequisites and credits that define specific and measurable “green” building criteria. By complying with the prerequisites and a specified number of the available credits, projects can achieve certification as a LEED® Green Building. In GSA building projects, LEED is being used as both a set of criteria and as a measurement tool. As of FY 2000 all new GSA building projects must meet the criteria for basic LEED® certification.

Leadership in Energy and Environmental Design (LEED) Green Building Rating System® Reference Guide for New Construction & Major Renovations

Available: www.leedbuilding.org

A sustainable design guide and user manual for the LEED Green Building Rating System. The *Reference Guide* is a 328-page manual that provides detailed information, resources and standards for the credits covered in LEED. It is intended to help aspiring projects understand the benefits of compliance and apply the criteria.

U.S. Courts Design Guide, 4th Edition

Available: www.wbdg.org/references/ccbdoc.php?i=65&r=1

The *U.S. Courts Design Guide* has been prepared for judges, architects, engineers, and court administrators who will be involved in federal court construction projects. It addresses facilities-related problems caused by heightened security needs, automation of legal processes, and significant caseload increases as well as accommodates the dynamics and complexities of the modern courthouse, and meets demands for high levels of performance.

Design Excellence Program Guide

Available: www.wbdg.org/references/ccbdoc.php?i=277&r=1

The *Design Excellence Program Guide* clarifies critical elements of the Design Excellence Program and enables GSA officials and staff, GSA clients, architectural/engineering firms hired by GSA, and GSA's private-sector peer professionals to become partners in design excellence and creators of an architectural legacy that all Americans can point to with pride. Use of the *Guide* will help ensure the fairness and integrity of the Design Excellence process and establish the high level of professionalism and respect required among parties to carry a project to a successful and rewarding conclusion. Sustainable Design is one of the evaluation factors for selecting architectural/engineering firms.

Project Planning Guide

Available:

www.gsa.gov/Portal/gsa/ep/programView.do?pageTypeId=8195&ooiid=8149&programPage=%2Fep%2Fprogram%2FgsaDocument.jsp&programId=8307&channelId=-12893

The *Project Planning Guide* was created to assist all of those who develop GSA's Capital Program in evaluating, developing, and implementing federal facilities projects. For GSA staff about to embark on a Feasibility Study or Program Development Study (PDS), this *Guide* outlines the project delivery process and keys to success. For other participants in a Feasibility Study or PDS effort, this *Guide* provides information on how they can support the process, as a team member, expert resource, or intended user of the final product.

Whole Building Design Guide (WBDG)

Available: www.wbdg.org

The Whole Building Design Guide (WBDG) is the only knowledge-based Web portal designed to provide government and industry practitioners with one-stop access to up-to-date information on a wide range of federal construction criteria, guidance, and technology from an integrated, or "whole building," perspective. Through dynamic Web technology, the WBDG provides users—design professionals and project managers—an overview of the various topics, concepts, and best practices associated with good whole building design, and then provides a ready means of accessing commercial and government guides, standards, and criteria needed to create such designs. The WBDG contains an entire design objective branch with a number of resource pages related to sustainability and the LEED® Green Building Rating System.

GreenerBuildings

Available: www.greenerbuildings.com

GreenerBuildings.com is a resource for environmentally responsible building development. It is a resource to help companies of all sizes and sectors understand and address building design, construction, and operation in a way that aligns environmental responsibility with business success. Users can view information by topic areas or by LEED® categories.

Appendix C:

Summary of LEED Scorecards for Recent GSA Projects

The following table shows the LEED credits pursued or being pursued for a number of recent GSA building projects.

U.S. GENERAL SERVICES ADMINISTRATION LEED PROJECT CHECKLISTS	COURTHOUSE YOUNGSTOWN - FINAL	SSA RENOVATION, WOODLAWN- FINAL	SSA CHILD CARE, WOODLAWN- FINAL	EPA TECH CTR, KANSAS CITY	MLK, ATLANTA	MOORHEAD, PITTSBURGH	COURTHOUSE, LITTLE ROCK	FED BLDG, SAN FRANCISCO	ATF HQ, WASHINGTON, DC	FTO, ALEXANDRIA	EPA LAB, CHELMSFORD, V1.0	OKC FED CAMPUS, OKC- V1.0	TALLY (V/TOTAL)
Sustainable Sites													
Credit 1 Site Selection	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y			10/12
Credit 2 Urban Redevelopment	Y	?	N	N	?	Y	Y	Y	Y	Y	N	Y	7/12
Credit 3 Brownfield Redevelopment	Y	N	N	Y	N	N	?	Y	Y	Y	Y	Y	7/12
Credit 4.1 Alternative Transportation, Public Transportation Access	Y	Y	Y	Y	Y	Y	?	Y	Y	Y	Y	Y	10/12
Credit 4.2 Alternative Transportation, Bicycle Storage & Changing Rooms	N	Y	N	Y	Y	N	?	?	Y	?	Y	Y	6/12
Credit 4.3 Alternative Transportation, Alternative Fuel Refueling Stations	N	N	N	?	?	N	N	?	N	?	Y	N	1/12
Credit 4.4 Alternative Transportation, Parking Capacity	?	Y	N	?	?	Y	?	Y	Y	N	Y	Y	7/12
Credit 5.1 Reduced Site Disturbance, Protect or Restore Open Space	Y	N	Y	Y	?	N	Y	Y	Y	Y	Y	Y	8/12
Credit 5.2 Reduced Site Disturbance, Development Footprint	Y	N	Y	Y	N	N	Y	?	Y	N	Y	Y	7/12
Credit 6.1 Stormwater Management, Rate or Quantity	Y	N	Y	?	?	N	Y	Y	Y	N	N	Y	6/12
Credit 6.2 Stormwater Management, Treatment	N	N	N	N	N	N	N	Y	Y	?	Y		3/12
Credit 7.1 Landscape & Exterior Design to Reduce Heat Islands, NonRoof	Y	N	N	Y	Y	N	Y	Y	Y	Y	Y	Y	8/12
Credit 7.2 Landscape & Exterior Design to Reduce Heat Islands, Roof	Y	?	?	Y	?	N	Y	Y	Y	N	N	Y	6/12
Credit 8 Light Pollution Reduction	Y	?	Y	?	Y	Y	?	Y	N	?			5/12
Water Efficiency													
Credit 1.1 Water Efficient Landscaping, Reduce by 50%	Y	Y	Y	Y	Y	N	Y	Y	Y	?	Y		9/12
Credit 1.2 Water Efficient Landscaping, No Potable Use or No Irrigation	Y	Y	Y	Y	N	N	N	?	?	N	Y		5/12
Credit 2 Innovative Wastewater Technologies	N	N	N	?	N	N	N	N	N	N	N	N	0/12
Credit 3.1 Water Use Reduction, 20% Reduction	N	N	N	?	?	Y	N	Y	?	N	Y	Y	4/12
Credit 3.2 Water Use Reduction, 30% Reduction	N	N	N	N	?	N	N	Y	?	N			1/12
Energy & Atmosphere													
Credit 1.1 Optimize Energy Performance, 20% New / 10% Existing	N	Y	Y	?	Y	Y	Y	Y	Y	?	Y	Y	9/12
Credit 1.1 Optimize Energy Performance, 20% New / 10% Existing	N	Y	Y	?	Y	Y	Y	Y	Y	?	Y	Y	9/12
Credit 1.2 Optimize Energy Performance, 30% New / 20% Existing	N	Y	Y	?	?	?	?	?	?	N	Y	Y	5/12
Credit 1.2 Optimize Energy Performance, 30% New / 20% Existing	N	Y	Y	?	?	?	?	Y	?	N	Y	Y	5/12
Credit 1.3 Optimize Energy Performance, 40% New / 30% Existing	N	Y	Y	?	N	N	N	Y	?	N	N	N	3/12
Credit 1.3 Optimize Energy Performance, 40% New / 30% Existing	N	N	N	?	N	N	N	Y	?	N	N	N	1/12
Credit 1.4 Optimize Energy Performance, 50% New / 40% Existing	N	N	N	?	N	N	N	Y	N	N	N	N	1/12
Credit 1.4 Optimize Energy Performance, 50% New / 40% Existing	N	N	N		N	N	N	Y	N	N	N	N	1/12
Credit 1.5 Optimize Energy Performance, 60% New / 50% Existing	N	N	N	N	N	N	N	Y	N	N	N	N	1/12
Credit 1.5 Optimize Energy Performance, 60% New / 50% Existing	N	N	N	N	N	N	N	Y	N	N	N	N	1/12
Credit 2.1 Renewable Energy, 5%	N	N	N	N	N	N	N	Y	?	N		N	1/12
Credit 2.2 Renewable Energy, 10%	N	N	N	N	N	N	N	Y	N	N	N	N	1/12
Credit 2.3 Renewable Energy, 20%	N	N	N	N	N	N	N	Y	N	N	N	N	1/12
Credit 3 Additional Commissioning	N	Y	?	Y	Y	Y	?	Y	?	N		N	5/12
Credit 4 Ozone Depletion	Y	Y	N	?	Y	?	Y	Y	?	?	Y	Y	6/12
Credit 5 Measurement & Verification	N	Y	N	N	?	Y	Y	Y	Y	?	Y	Y	7/12
Credit 6 Green Power	N	N	N	N	N	?	N	?	?	N	Y		1/12
Materials & Resources													
Credit 1.1 Building Reuse, Maintain 75% of Existing Shell	N	Y	N	N	Y	Y	Y	N	Y	N	N	N	5/12
Credit 1.2 Building Reuse, Maintain 100% of Shell	N	N	N	N	Y	Y	Y	N	N	N	N	N	3/12
Credit 1.3 Building Reuse, Maintain 100% of Shell & 50% Non-Shell	N	N	N	N	N	N	N	N	N	N	N	N	0/12
Credit 2.1 Construction Waste Management, Divert 50%	Y	Y	Y	?	?	Y	N	?	N	?	Y	Y	6/12
Credit 2.2 Construction Waste Management, Divert 75%	N	Y	Y	?	?	N	N	Y	Y	N	?		3/12
Credit 3.1 Resource Reuse, Specify 5%	N	N	N	N	N	Y	?	N	?	N	N		1/12
Credit 3.2 Resource Reuse, Specify 10%	N	N	N	N	N	N	N	N	?	N	N		0/12
Credit 4.1 Recycled Content, Specify 25%	Y	N	Y	?	Y	Y	?	Y	?	Y	Y	Y	7/12
Credit 4.2 Recycled Content, Specify 50%	Y	N	Y	?	?	?	N	?	?	N	N		2/12
Credit 5.1 Local/Regional Materials, 20% Manufactured Locally	Y	Y	Y	Y	Y	Y	N	N	?	?	Y	Y	8/12
Credit 5.2 Local/Regional Materials, of 20% Above, 50% Harvested Locally	N	Y	Y	?	?	N	N	N	?	N			2/12
Credit 6 Rapidly Renewable Materials	N	N	N	N	N	N	N	?	?	N			0/12
Credit 7 Certified Wood	N	N	N	N	?	Y	Y	N	?	?			2/12
Indoor Environmental Quality													
Credit 1 Carbon Dioxide Monitoring	Y	Y	N	?	Y	Y	Y	Y	Y	N	?	Y	8/12
Credit 2 Increase Ventilation Effectiveness	N	N	?	N	Y	Y	N	N	Y	Y			4/12
Credit 3.1 Construction IAQ Management Plan, During Construction	Y	Y	?	Y	Y	Y	Y	Y	Y	?	Y	Y	10/12
Credit 3.2 Construction IAQ Management Plan, Before Occupancy	Y	Y	Y	?	Y	?	?	Y	Y	?	Y		7/12
Credit 4.1 Low-Emitting Materials, Adhesives & Sealants	Y	N	Y	Y	Y	Y	Y	Y	?	Y	Y	Y	10/12
Credit 4.2 Low-Emitting Materials, Paints	?	N	N	?	Y	Y	Y	Y	Y	Y	Y	Y	8/12
Credit 4.3 Low-Emitting Materials, Carpet	Y	N	Y	Y	Y	Y	Y	Y	Y	?			9/12
Credit 4.4 Low-Emitting Materials, Composite Wood	Y	?	N	?	N	?	Y	Y	Y	?	?		4/12
Credit 5 Indoor Chemical & Pollutant Source Control	?	N	Y	N	?	N	Y	Y	Y	?	Y	Y	6/12
Credit 6.1 Controllability of Systems, Perimeter	N	N	N	N	?	N	N	N	?	N			0/12
Credit 6.2 Controllability of Systems, Non-Perimeter	N	N	N	?	?	N	N	N	?	N			0/12
Credit 7.1 Thermal Comfort, Comply with ASHRAE 55-1992	?	Y	Y	?	Y	?	Y	Y	Y	Y			7/12
Credit 7.2 Thermal Comfort, Permanent Monitoring System	?	Y	Y	Y	?	N	Y	Y	Y	?			6/12
Credit 8.1 Daylight & Views, Daylight 75% of Spaces	Y	N	?	N	?	Y	?	Y	?	N			3/12
Credit 8.2 Daylight & Views, Views for 90% of Spaces	Y	N	Y	N	?	N	N	N	?	N			2/12
Innovation & Design Process													
Credit 1.1 Innovation in Design	Y	Y	Y	?	?	N	?	Y	?	N	Y		5/12
Credit 1.2 Innovation in Design	N	?	?	Y	N	N	?	Y	?	N			2/12
Credit 1.3 Innovation in Design	N	?	N	?	N	N	?	N	?	N			0/12
Credit 1.4 Innovation in Design	N	N	N	?	N	N	?	N	?	N			0/12
Credit 2 LEED Accredited Professional	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	12/12
PROJECT TOTALS													
	Y 27	26	28	18	24	25	25	45	29	11	26	26	
	N 5	6	6	28	22	8	16	8	28	18	5	0	
LEED Rating Levels													
26 - 32 LEED Certified													
33 - 38 LEED Certified Silver Level													
39 - 51 LEED Certified Gold Level													
52 - 69 LEED Certified Platinum Level													
KEY													
Y	Yes, pursued or will pursue												
?	Maybe, uncertain if will pursue or not												
N	No, not pursued or will not pursue												
	Available credit, but not used												



Smarter Solutions

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GSA Public Buildings Service
Office of the Chief Architect

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