

LEED and Planning of our Communities



Sustainability Is...

more transportation choices and less traffic

vibrant cities, suburbs, and towns

a portfolio approach

strategic and multi-faceted

wider variety of housing choices

well-planned growth that improves the quality of life

Sustainability Is NOT...

against cars and roads

anti-suburban

anti-industry

anti-technology

against growth

about telling people where or how to live

Triple Bottom Line



Slide Source: The USGBC

Green Buildings Occupants are

HEALTHIER AND MORE PRODUCTIVE

In the U.S., people spend, on average, **90%** of their time indoors, where pollution levels may be two to five times higher than outdoors.

Green Buildings typically have better indoor air quality

- An estimated 21,100 out of 146,400 lung cancer deaths were radon related.
- Indoor pollution is a major factor in asthma.

Reduces occurrence of Sick Building Syndrome

- Sick Building Syndrome (SBS) is a combination of symptoms caused by poor indoor air quality such as poor circulation, off gassing of materials, or moisture buildup.
- Sustainable building practices improve indoor air quality therefore minimizing chances of Sick Building Syndrome occurring.

Indirect **COST SAVINGS** of Green Buildings

- Increased Productivity
- Decreased Absenteeism
- Reduced Healthcare Claims
- Minimized Remediation

GLOBAL CO₂ EMISSIONS BY SECTOR:

#1. Buildings

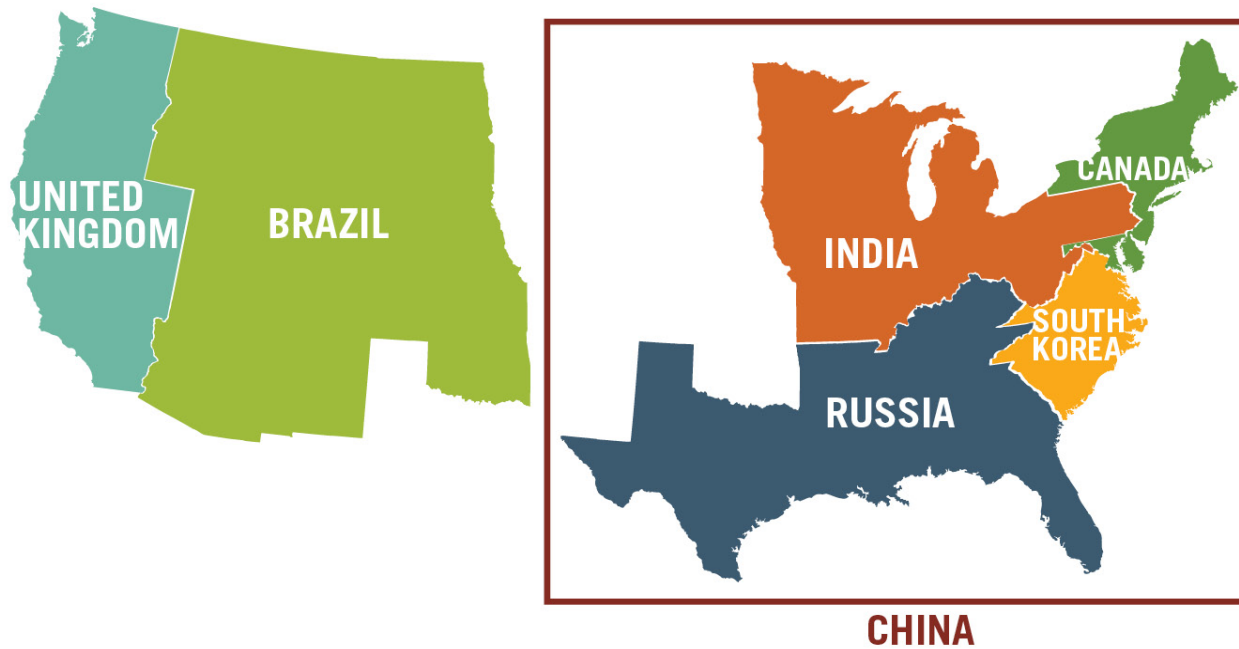
#2. Transportation

#3. Industry

Source: Energy Information Administration (2006)



GLOBAL CO₂ EMISSIONS BY COUNTRY:

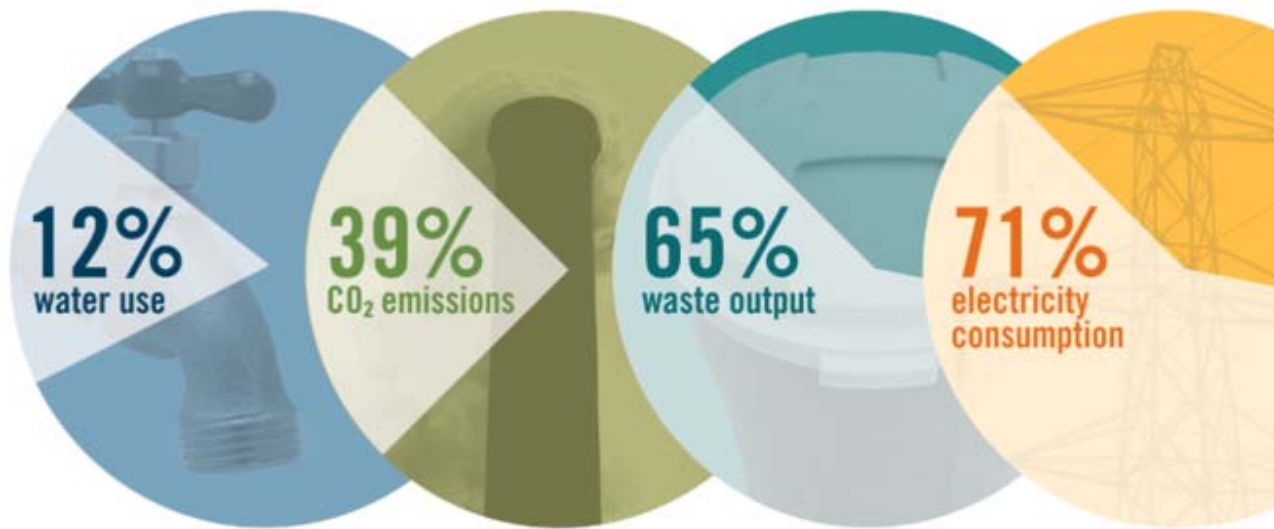


© 2007, World Resources Institute

Slide Source: The USGBC

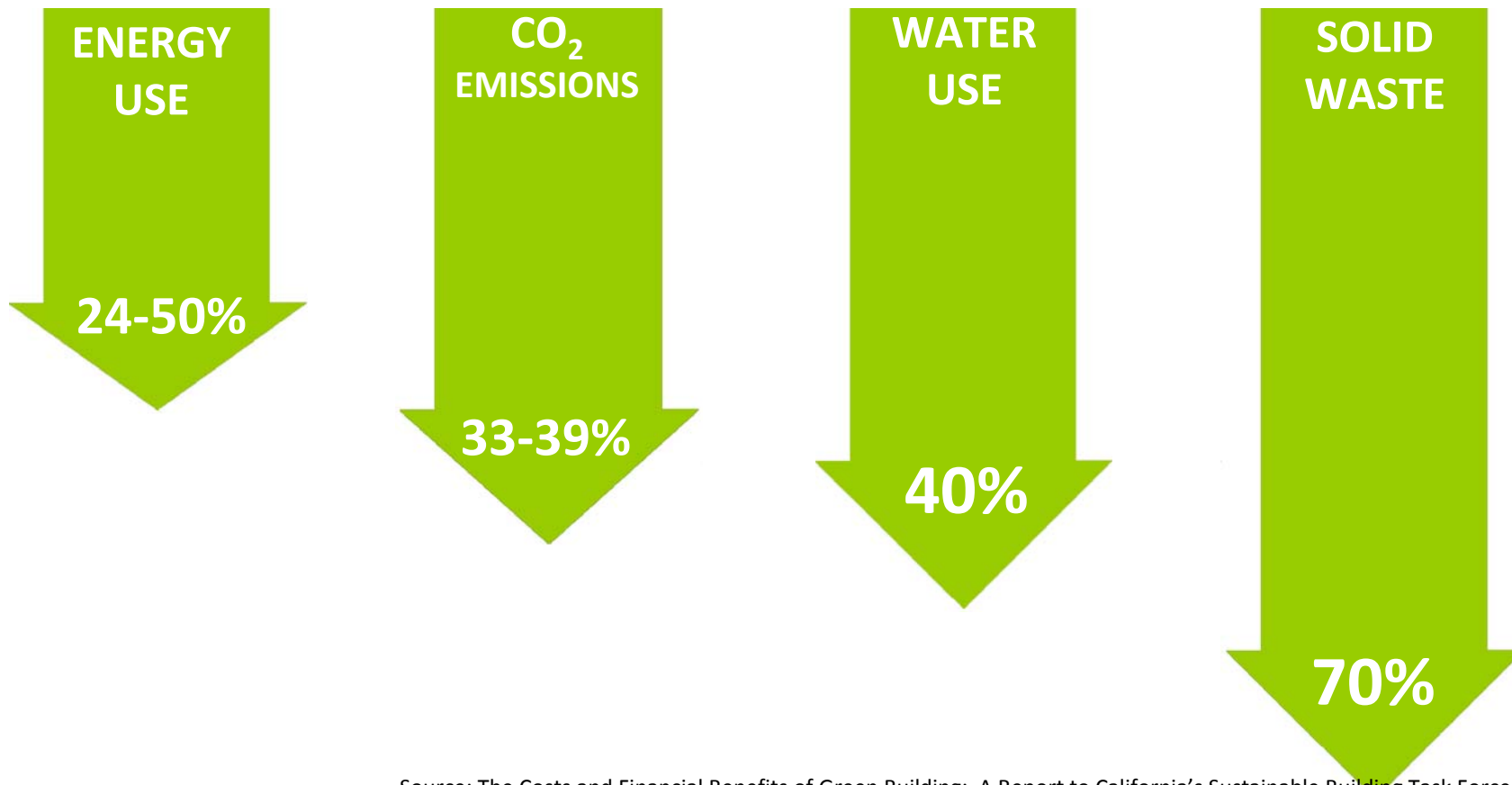
U.S. Building

Impacts:



Slide Source: The USGBC

GREEN BUILDINGS CAN REDUCE CONSUMPTION BY:



Source: The Costs and Financial Benefits of Green Building: A Report to California's Sustainable Building Task Force

USGBC's Mission

To transform the way buildings and communities are designed, built and operated, enabling an environmentally and socially responsible, healthy and prosperous environment that improves the quality of life.

- LEED, or Leadership in Energy and Environmental Design, is an internationally-recognized green building certification system. Developed by the U.S. Green Building Council (USGBC) in March 2000
- LEED projects are in progress in 41 different countries – among these Canada, Brazil, Mexico and India.
- LEED-certified buildings are designed to:
 - Lower operating costs and increase asset value
 - Reduce waste sent to landfills
 - Conserve energy and water
 - Be healthier and safer for occupants
 - Reduce harmful greenhouse gas emissions
 - Qualify for tax rebates, zoning allowances and other incentives in hundreds of cities

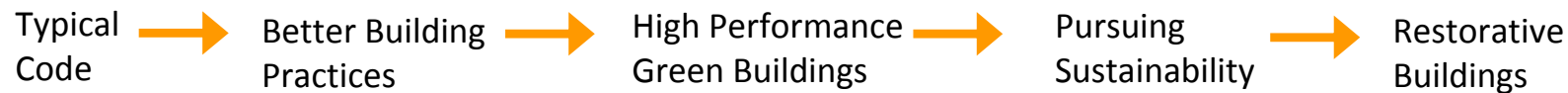


Why LEED?

Here are just some of the benefits:

- **Measurable level of sustainable achievement** –
Through commissioning and measurement & verification you are certain your building is performing as designed.
- Provides a **consistent and credible standard** for what constitute a green building that is understood by the industry and recognized by the general public.
- Demonstrate an owner's commitment to environmental stewardship and social responsibility.

CONTINUUM of GREEN:



Restorative: Involves approaching design in terms of using the activities of design and building to restore the capability of local natural systems to a state of self-organization and continual evolution.



CERTIFICATION PROCESS:

- Registration – Fee based on type and size of building
- Prepare Application – Continuous process throughout design phases
- Submit Application at end of construction
- Application Review
- Certification

CERTIFICATION LEVELS:



LEED 2009 v3 RATING SYSTEMS

Green Building Design & Construction:

- LEED for New Construction
- LEED for Core & Shell
- LEED for Schools
- LEED for Healthcare
- LEED for Retail

Green Interior Design & Construction:

- LEED for Commercial Interiors
- LEED for Retail Interiors

Green Building Operations & Maintenance:

- LEED for Existing Buildings
- LEED for Existing Schools

Next Version to be released approximately November 2012-2013

The LEED for New Construction Rating System is designed to guide and distinguish high-performance commercial and institutional projects, including office buildings, high-rise residential buildings, government buildings, recreational facilities, manufacturing plants and laboratories.

The LEED for Existing Buildings Rating System helps building owners and operators measure operations, improvements and maintenance on a consistent scale, with the goal of maximizing operational efficiency while minimizing environmental impacts. LEED for Existing Buildings addresses whole-building cleaning and maintenance issues (including chemical use), recycling programs, exterior maintenance programs, and systems upgrades.

SUSTAINABLE SITES

Required Prerequisite(s):

Construction Activity Pollution Prevention

Points (26 possible):

Site Selection

Development Density & Community Connectivity

Brownfield Redevelopment

Alternative Transportation – Public Transportation Access; and/or Bike Storage & Changing Rooms; and/or Low-Emitting and Fuel-Efficient Vehicles; and/or Parking Capacity

Site Development – Protect or Restore Habitat and/or Maximize Open Space

Stormwater Design – Quantity and/or Quality Control

Heat Island Effect – Nonroof and/or Roof

Light Pollution Reduction



WATER EFFICIENCY

Required Prerequisite(s):

Water Use Reduction

Points (10 possible):

Water Efficient Landscaping – Reduce by 50% or No potable Water Use or Irrigation

Innovative Wastewater Technologies

Water Use Reduction – by 30%; 35%; or 40%



ENERGY & ATMOSPHERE

Required Prerequisite(s):

Fundamental Commissioning of Energy Systems
Minimum Energy Performance
Fundamental Refrigerant Management

Points (35 possible):

Optimize Energy Performance – 12-48% for New Buildings and 8-44% for Existing Building Renovations (Note 19 points possible – indicator of importance of this item. Points available in one point increments by increasing improvement in corresponding 2% steps)

On-Site Renewable Energy – 1%; 3%; 5%; 7%; 9%; 11%; or 13%

Enhanced Commissioning

Enhanced Refrigerant Management

Measurement and Verification

Green Power



MATERIALS & RESOURCES

Required Prerequisite(s):

Storage and Collection of Recyclables

Points (14 possible):

Building Reuse – Reuse 55%; 75%; or 95%; and Maintain Interior Nonstructural Elements

Construction Waste Management – 50% Recycled or Salvaged; or 75%

Material Reuse – Reuse 5% or 10%

Recycled Content – 10% or 20% of Content

Regional Materials – 10% or 20% of Materials

Rapidly Renewable Materials

Certified Wood



INDOOR ENVIRONMENTAL QUALITY

Required Prerequisite(s):

Minimum Indoor Air Quality Performance
Environmental Tobacco Smoke (ETS)

Points (15 possible):

Outdoor Air Delivery Monitoring
Increased Ventilation

Construction Indoor Air Quality Management Plan – During Construction and/or
Before Occupancy

Low-Emitting Materials – Adhesives and Sealants; and/or Paints and Coatings; and/or
Flooring Systems; and/or Composite Wood and Agrifiber Products

Indoor Chemical and Pollutant Source Control

Controllability of Systems – Lighting and/or Thermal Comfort

Thermal Comfort – Design and/or Verification

Daylight and Views



INNOVATION IN DESIGN

No Required Prerequisites – Points (6 Possible):

For innovation or next step compliance with credits listed above.

Point also available for LEED Accredited Professional on team.

REGIONAL PRIORITY

No Required Prerequisites – Points (4 Possible of 6): For Regionally Defined Credits.

For Grand Forks:

MRc1.1	Building Reuse: 55%
MRc2	Recycle/Salvaged: 50%
SSc5.2	Maximize Open Space
SSc6.1	Stormwater Management Quantity Control
SSc8	Light Pollution Reduction
WEc3	35% Reduction



Empire State Building Achieves LEED Gold

Bank of America Announces New Energy Efficiency Finance Program

Expanding on LEED: Expert-Accredited Green Building Degrees

Green Schools for Every Child in This Generation

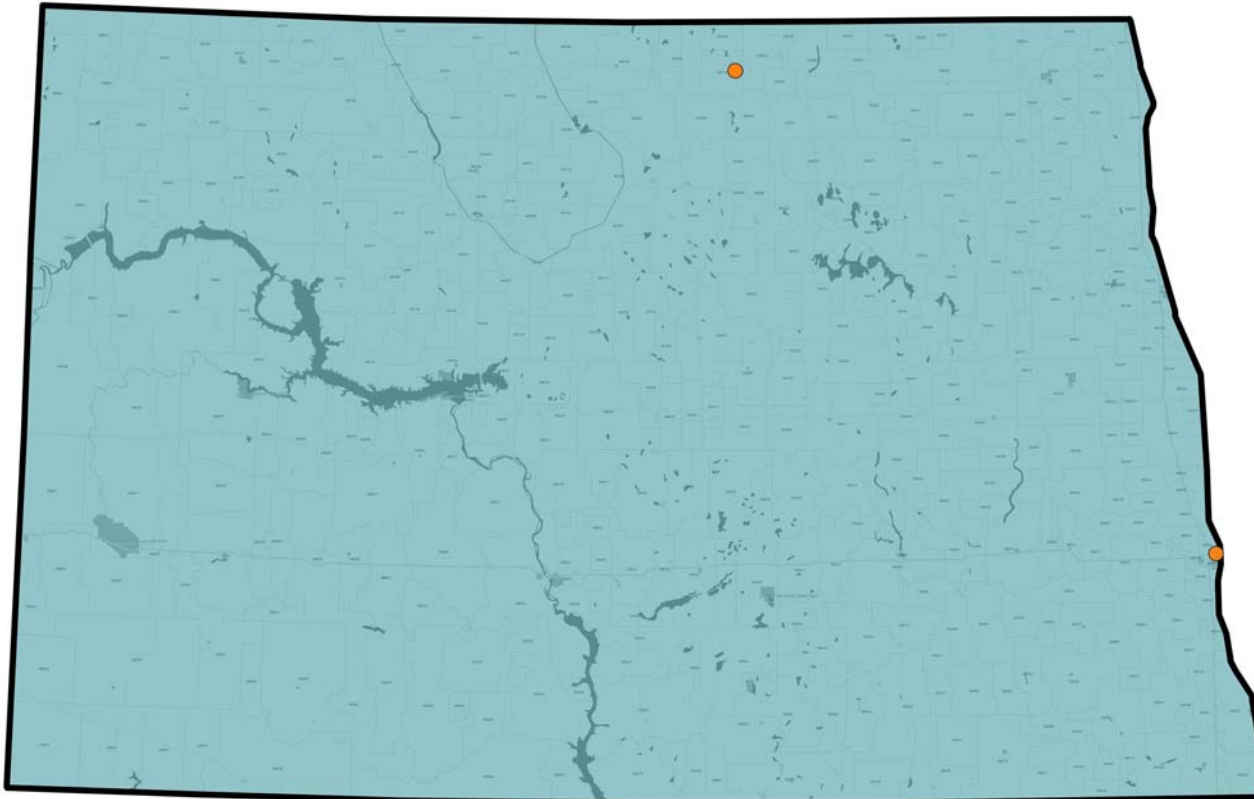
Mayor Lee Introduces New Municipal
Green Building Standards Ordinance



Registered

Certified

Registered Prior to 2007



LEED Rating System:

US Green Building Council's
Leadership in Energy and
Environmental Design

A guideline for designing and
constructing the world's greenest,
most energy efficient, and high
performing buildings.

LEED Registered Projects in North Dakota
Current: 6-2010

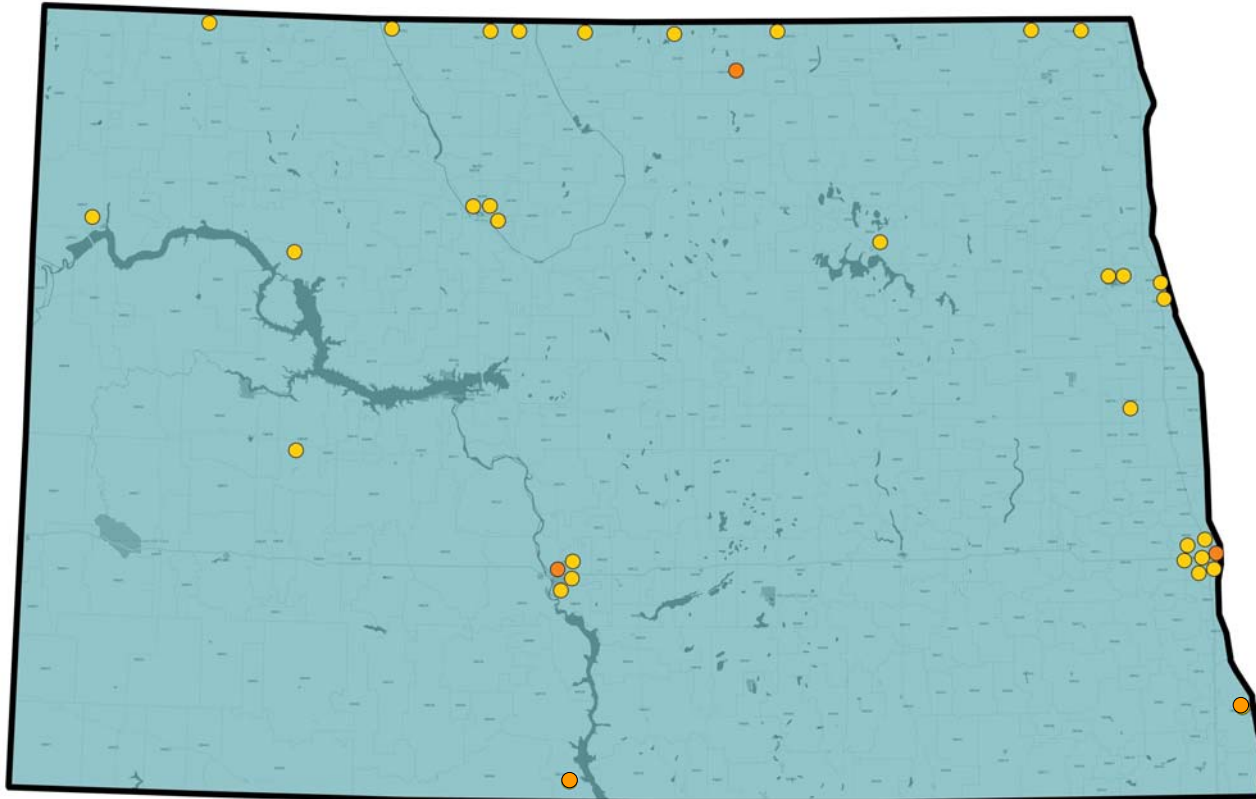
 USGBC - North Dakota Chapter



Registered

Certified

Registered After to 2007



LEED Rating System:

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 USGBC - North Dakota Chapter



LEED & GREEN BUILDING - TRENDS

While many jurisdictions now require LEED certification for their own buildings and some require LEED certification for private buildings, **LEED was never intended as a mandatory green building code.** Recently several code language green building standards have been developed, including ASHRAE 189, California's CALGreen, and the ICC's International Green Construction Code.



Leadership in Energy and Environmental Design

A leading-edge system for certifying the greenest performing buildings in the world



LEED & GREEN BUILDING - TRENDS

LEED Credit Affecting City Codes, Planning and Zoning

SSpr1 Construction Activity Pollution Prevention – Required on every project

SSc3 Brownfield Redevelopment – Providing information that highlights locations of property that qualify.

SSc4.1 Public Transportation – Access to 2 bus routes within ¼ mile of project

SSc4.2 Bicycle Storage & Changing Rooms – Bike Paths for LEED for Schools, Requirement for long-term bicycle parking

SSc4.3 Low-Emitting Vehicles – Required preferred parking stalls

SSc4.4 Parking Capacity – Limitations not to exceed zone requirement or to be less than 5% of FTE (full-time equivalent) of the building or 25% less if no zoning requirement (i.e. some university campuses). Also require Carpool preferred parking

SSc5.1 Protect or Restore Habitat – required disturbance limitations at Greenfield sites, allowance for native & adaptive species for planting counts, threshold allowance (50%) for open space. If an urban site, allowance for green-roof or planter boxes with native/adaptive plantings to count towards planting counts

SSc5.2 Maximize Open Space - Provisions for Green Roof to count towards open space in urban setting

LEED & GREEN BUILDING - TRENDS

LEED Credit Affecting City Codes, Planning and Zoning

SSc6.1 Stormwater Design – Allowance for greywater and on-site water treatment & reuse

SSc8.2 Light Pollution Reduction – Types of Luminaries – Cut-offs and Power Density

WEpr1 & c3 Water Use Reduction – Allowance for waterless urinals, greywater reuse for plumbing fixtures

WEc1 Water Efficient Landscaping – Allowance to use native and adaptive plantings for plant counts

Energy & IECC & IGC – Allowance to use ASHRAE that is approved for the version of LEED project is registered under. Typically is current with what IECC is, but may have issue when either upgrades synchronization. Allowance to use ASHRAE 189.1 in lieu of 90.1

Materials & Resources – Encouragement of Construction Waste Management & Opportunities

IEQpr2 Environmental Tobacco Smoke Control – Limitation of 25 feet from buildings if no interior smoking allowed

IEQc4 Low-Emitting Materials – Placing VOC restrictions for indoor environments

LEED & GREEN BUILDING - TRENDS

LEED for Neighborhood Development

LEED for Neighborhood Development (LEED ND) introduces important new levers at the planning and infrastructure scale that, when coupled with the other LEED green building rating systems, can more rapidly and effectively transform the way that buildings and communities are designed, built and operated.

The LEED-ND rating system is divided into the following credit categories: Smart Location and Linkage (SLL), Neighborhood Pattern and Design (NPD), and Green Infrastructure and Buildings (GIB).

LEED & GREEN BUILDING - TRENDS

LEED for Neighborhood Development

The Smart Location & Linkage (SLL) section focuses on WHERE the project is built. The goal of the prerequisites is to limit the impact on prime farmland, wildlife habitat, wetlands, and water bodies. At the same time, they encourage projects to locate adjacent to existing development, in areas near services or transit.

The Neighborhood Pattern & Design (NPD) section looks at HOW the project is laid out. This section promotes compact, complete, and connected communities that include a variety of building types and land uses. This section reminds us that the best neighborhoods have a unique character that reflects local preferences. Criteria in this section promote civic spaces—such as parks, farmers markets, and plazas—where residents, workers, and visitors can meet and build community.

The Green Infrastructure & Buildings (GIB) section focuses on WHAT measures can reduce the environmental impacts associated with the construction and operation of buildings and infrastructure. It not only promotes more efficient energy and water use—especially important in urban areas where the burden on infrastructure can be enormous – but also comprehensive approaches to stormwater management and solid waste treatment.

LEED & GREEN BUILDING - TRENDS

LEED for Neighborhood Development

Stage 1 – Conditionally Approved Plan: provides the conditional approval of a LEED-ND Plan available for projects before they have completed the entitlements, or public review, process. It is envisioned that completing Stage 1 will help projects get support from the local government and from the community.

Stage 2 – Pre-Certified Plan: pre-certifies a LEED-ND Plan and is applicable for fully entitled projects or projects under construction. Completing this review can help projects secure financing, expedited permitting or attract tenants.

Stage 3 – Certified Neighborhood Development: completed projects formally apply for LEED certification to recognize that the project has achieved all of the prerequisites and credits attempted.

LEED & GREEN BUILDING - TRENDS

Green Building Incentive Strategies: One of the most effective and more popular strategies to encourage green building is to incentivize the market through financial or structural incentives. Rewarding developers or homeowners who practice green building techniques spurs innovation and demand for green building technologies.

Structural Incentives: These incentives work by encouraging developers to practice green building through rewards such as additional density bonuses or expedited permitting processes. At low or no cost to the municipality, building green can be made a more attractive option to developers.

Expedited Review/Permitting Processes: Review and permitting processes vary widely in length from one jurisdiction in another, in some municipalities these processes can take up to 18 months. Allowing developer to significantly reduce the duration of this process, in exchange for committing to specific green building standards, can result in significant cost savings for the developer. This allows a municipality to offer a significant incentive with little or no financial investment, since it only requires a shift in permitting priority.

LEED & GREEN BUILDING - TRENDS

Density and Height Bonuses: Like expedited permitting processes, density bonuses require little or no financial investment by the municipality. Many municipalities allow for percentage increases in Floor Area Ratio or other measures of density contingent upon certification or proof of green building practices.

Financial Incentives: Financial incentives are direct incentives in the form of tax credits or grants to developers who propose or build green buildings. However, many of these programs do not directly impact a municipality's finances since the proposed developments will often increase the assessed property value in the city and which allows the city to offer financial incentives without any threat of reduced revenues.

Tax Credits: Many municipalities already offer tax credits as a means of advancing specific policy agendas. These same principles can be applied to homes or developments that achieve certain green building goals.

Fee Reduction/Waiver: Some municipalities that charge fees for permit review or other permitting processes have begun offering reductions or waivers for developers following green building standards. Many times this incentive can be paired with a structural incentive such as expedited permitting.

LEED & GREEN BUILDING - TRENDS

Grants: Unlike the other incentive programs discussed above grants will require a financial investment by the city. These programs can often be funded by one of the revenue generating strategies discussed earlier. Grants can be given to homeowners or developers to go towards certification or other costs associated with green building.

Revolving Loan Funds: Typically these programs work by allocating a large fund to be used for low interest loans to those seeking to build or renovate to green building standards. These loans are then repaid to the fund at a rate lower than the operational cost savings from the improvements in order to lower the up - front costs associated with some green building practices and encourage home owners and developers to build green. The fund is continuously replenished by the repayments so that it can be used for additional loans.

Technical Assistance: Many municipalities are also offering free planning or certification training and assistance. This assistance may allow for a developer who is unfamiliar with green building practices to build green.

Marketing Assistance: One important aspect of certifying projects under LEED is being able to use this as a marketing tool. Some municipalities have begun to offer free marketing assistance via signage, awards, websites, press releases, and other means as an incentive for developers to build to green standards.

Source: <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=2078>



LEED & GREEN BUILDING - TRENDS

LEED-ND GOLD
PRE-CERTIFIED PLAN

TWINBROOK STATION
ROCKVILLE, MARYLAND

80% of the buildings will pursue LEED certification

15% affordable housing

134 dwelling units per acre

LEED® Facts
Twinbrook Station
Rockville, Maryland

LEED for Neighborhood Development (Fit) Certification date November 19, 2008	
Gold	66*
Smart Location & Linkage	20/30
Neighborhood Pattern & Design	30/30
Green Construction & Technology	10/31
Innovation & Design Process	6/6
Certification Type/Stage Certified Plan, Stage 2	
*Out of a possible 100 points	

LEED-ND PILOT

JACKSON SQUARE REDEVELOPMENT INITIATIVE
ROXBURY AND JAMAICA PLAIN, MASSACHUSETTS

521 weekday transit trips available within 1/4 mile

70% green roofs and 3 acres new open space

69% rental units priced below 40% of the area's median income (AMI)

LEED® Facts
Jackson Square Redevelopment Initiative
Roxbury and Jamaica Plain, Massachusetts

LEED for Neighborhood Development (Fit) Certification date November 12, 2008	
Silver	51*
Smart Location & Linkage	21/30
Neighborhood Pattern & Design	22/30
Green Construction & Technology	7/31
Innovation & Design Process	1/6
Certification Type/Stage Certified Plan, Stage 2	
*Out of a possible 100 points	

LEED & GREEN BUILDING - TRENDS



<http://www.cnu.org/node/869>

Excelsior and Grand

Location: St. Louis Park, MN, 55416

Lessons learned: Complex mixed-use redevelopment projects take time, a shared vision, and partnerships

Previous site status: Greyfield (former commercial)

Status: 76-99% Built

Features: Affordable/subsidized housing, Bus transit, Civic buildings & parks, Mixed uses, Sustainable infrastructure, Transit oriented development.

Land area (in acres): 15

Retail area (in sq. ft.): 91000

Number of residential units (include live/work): 660

Civic uses (type and size): 1.5 acre town green connecting arterial and regional park

Parks & green space (in acres): 1

Residential types: Mid-rise/loft, Low-rise flats.

Previous site status: Greyfield (former commercial)

Starting/Ending construction/implementation: 2001 - 2007



SUSTAINABLE STRATEGY

Part I

Reduce loads/demand using passive solar design, daylighting, shading, orientation, use of natural ventilation, site design and improving the building envelope.

Meet loads efficiently and effectively through strategies such as energy efficient/effective lighting and high-efficiency/effective MEP equipment, controls. Understand your climate and the energy produced in your region – clean energy can vary from city to city.

Use renewables to meet energy needs; on-site renewables are the first choice, with local and regional renewables combined to make up the difference. Doing the above steps right away will result in the need for much smaller renewable energy systems, making carbon neutrality achievable.

Use purchased Offsets last when all other means have been looked at on site.

SUSTAINABLE STRATEGY

Part II

Owner Project Requirements: describe the primary purpose, program, and use of the proposed project and overarching goals, including energy goals and operational goals.

Building Energy Modeling: establishing a benchmark or baseline and comparing it to a design case to estimate energy improvements and performance.

Daylighting Simulation: studying how building orientation, room layout and shape, shading devices and glazing can help improve occupant comfort and improve energy efficiency.

Commissioning: verifying project's energy related systems are installed, calibrated and perform according to the owner's project requirements, basis of design and construction documents.

SUSTAINABLE STRATEGY

Part III

Measurement and Verification: providing ongoing accountability of building energy consumption over time.

Building Envelope Commissioning: infrared thermography observations; field moisture intrusion window system testing; visual observations during construction.

Materials & Resources: focus on materials with recycled content, materials that can be down-cycled and recycled, regionally sourced, and are low-emitting.

Sustainable Sites: looking beyond the building footprint and utilizing site systems to improve overall efficiency through green roofs, rainwater collection and reuse, stormwater management.

RESOURCES

- US Green Building Council <http://www.usgbc.org>
- USGBC North Dakota Chapter
<http://www.usgbcnorthdakota.com>
- Sustainable Design and Green Building Toolkit for Local Governments (includes assessment tools)
<http://www.epa.gov/region4/recycle/green-building-toolkit.pdf>
- US Green Building Council Public Policy
<http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1780>
- CalGreen
<http://www.bsc.ca.gov/CALGreen/default.htm>
- International Green Construction Code & ASHRAE 189.1 download
<http://www.iccsafe.org/cs/IGCC/Pages/IGCCDownloadV2.aspx>
- A Citizen's Guide to LEED for Neighborhood Development
http://www.nrdc.org/cities/smartgrowth/files/citizens_guide_LEED-ND.pdf

