Introduction to Green Building & LEED

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O'Brien & company
What’s Happening in the Marketplace?
What’s Happening in the Marketplace?

• Rapid Adoption
• Green-washing
• Proliferation of Ratings
Rapid Adoption
Real Estate’s Latest Movement

Build Green, Make Green

The Greening of America’s Campus

It’s Easy Being Green
Local Demonstration Projects
Public Sector

- Depot Market Square
- WWU – Wade King Rec. Ctr.
- Kateri Court – Affordable Housing
- Whatcom County Courthouse - LEED for Existing Buildings
- Art & Children's Museum
- Waterfront - LEED for Neighborhood Development
- Boys & Girls Club
Local Demonstration Projects
Private Sector

- Whatcom Educational Credit Union
- Bisesse Dental Clinic
- Community Food Co-op
- Gaston Bay Building
Proliferation

- Regional Programs – Built Green
- USGBC – LEED
- One Planet Living
- GBI – Green Globes
- NAHB – Green Building Standard
- MLS Listing Service
OUR 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.
USGBC membership growth reflects the expansion of green buildings in the market.
GREEN BUILDING NEAR YOU

USGBC Chapters are passionate advocates for green building in communities all across the country.
<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Amount Per Serving</th>
<th>% Daily Value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories</td>
<td>120</td>
<td></td>
</tr>
<tr>
<td>Total Fat</td>
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<td>5%</td>
</tr>
<tr>
<td>Saturated Fat</td>
<td>1g</td>
<td>5%</td>
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<tr>
<td>Trans Fat</td>
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<tr>
<td>Polyunsaturated Fat</td>
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<tr>
<td>Monounsaturated Fat</td>
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</tr>
<tr>
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<tr>
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<td>Protein</td>
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<td>10%</td>
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</tr>
<tr>
<td>Iron</td>
<td>4%</td>
<td></td>
</tr>
</tbody>
</table>

*Percent Daily Values are based on a 2,000 calorie diet.
Leadership in Energy and Environmental Design

A leading-edge system for certifying the greenest performing buildings in the world
GREEN BUILDING CERTIFICATION INSTITUTE

HEREBY CERTIFIES THAT

47,836

HAS ACHIEVED THE DESIGNATION OF

LEED® ACCREDITED PROFESSIONAL

BY DEMONSTRATING THE KNOWLEDGE OF GREEN BUILDING PRACTICE REQUIRED FOR SUCCESSFUL IMPLEMENTATION OF THE LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN (LEED®) GREEN BUILDING RATING SYSTEM™.
What Is Green Building?

- Site Planning
- Water Management
- Energy
- Material Use
- Indoor Environmental Quality
U.S. Building Impacts:

- 12% water use
- 39% CO₂ emissions
- 65% waste output
- 71% electricity consumption
U.S. Electricity Consumption

Buildings (operations) 71%

Industry 27%
U.S. ENERGY CONSUMPTION

BUILDINGS 39%

INDUSTRY 29%

TRANSPORTATION 32%
U.S. BUILDINGS IMPACTS ON RESOURCES

39% of total energy consumption
71% of electricity consumption
39% CO₂ emissions
30% of raw materials use
30% of waste output
12% of potable water consumption
WORLDWIDE, BUILDINGS ACCOUNT FOR...

17% fresh water withdrawals
25% wood harvest
33% CO₂ emissions
40% material and energy use
45% in China
PERCEIVED ADVANTAGES OF BUILDING GREEN

8-9% decrease in operating costs
7.5% increase in building values
6.6% improvement in ROI
3.5% increase in occupancy
3% rent increase
Increased Productivity.

SCHOOLS

20% BETTER TEST PERFORMANCE

HOSPITALS

2 1/2 DAY EARLIER DISCHARGE

RETAIL

INCREASE IN SALES PER SQUARE FOOT

FACTORIES

INCREASED PRODUCTION

OFFICES

2–16% PRODUCTIVITY INCREASE
Additional Construction Costs for LEED-certified buildings
Average for offices and schools, based on 40 buildings

<table>
<thead>
<tr>
<th>Level</th>
<th>Additional Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLATINUM</td>
<td>6.8%</td>
</tr>
<tr>
<td>GOLD</td>
<td>2.2%</td>
</tr>
<tr>
<td>SILVER</td>
<td>1.9%</td>
</tr>
<tr>
<td>CERTIFIED</td>
<td>0.66%</td>
</tr>
</tbody>
</table>
GREEN BUILDING IS AN INDUSTRY TREND NOT A FAD

$60 billion

$10 billion

2005  2007  2010

Residential

Commercial
LEED address the complete lifecycle of buildings:

- Homes
- Neighborhood Development (in pilot)
- Commercial Interiors
- Core & Shell
- New Construction
- Schools, Healthcare, Retail
- Existing Buildings Operations & Maintenance
# LEED Application Guides

<table>
<thead>
<tr>
<th>Application Guide</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lodging</td>
<td>Available-US Air Force</td>
</tr>
<tr>
<td>Campus</td>
<td>Available</td>
</tr>
<tr>
<td>Retail</td>
<td>Available - pilot</td>
</tr>
<tr>
<td>Healthcare (<a href="http://www.gghc.org">www.gghc.org</a>)</td>
<td>Development</td>
</tr>
<tr>
<td>Laboratories (<a href="http://www.labs21century.gov">www.labs21century.gov</a>)</td>
<td>Development</td>
</tr>
<tr>
<td>Schools (<a href="http://www.chps.net">www.chps.net</a>)</td>
<td>Available</td>
</tr>
</tbody>
</table>
Cross-Functional Team

Engineers Operations and Maintenance Teams
Building Occupants Building Managers
Faculty Environmental Health and Safety Staff
Groundskeepers Capital Planning Staff
Utility Managers Interior Designers Utility Managers
Custodial Team Property Managers Custodial Team
Human Resources Building Owners Human Resources
Purchasing Staff Environmental Groups
Engineers Operations and Maintenance Teams
Building Occupants Building Managers
Building Occupants Building Managers
LEED Is Consensus-Based

STAKEHOLDERS

VOLUNTEER COMMITTEES

FULL MEMBERSHIP

LEED
Consensus-Based Standards
USGBC has four levels of LEED:
Certification Benefits

• Third party validation of achievement
• Qualify for growing array of state and local government incentives
• Contribute to growing knowledge base
• LEED certification plaque to mount on building
• Official certificate
• Receive marketing exposure through USGBC web site, case studies and media announcements

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Certification vs. Accreditation

- Buildings are Certified
  - LEED Certification is a process

- People are Accredited
  - After passing the LEED Professional Accreditation Exam

- LEED not LEEDS
LEED Credentialing Program

LEED Green Associate

LEED AP ID+C
LEED AP HOMES
LEED AP O+M
LEED AP ND
LEED AP BD+C

LEED AP Fellow
New LEED Credentialing

Timeline:

FEBRUARY 2009
LEED Green Associate Exam - Beta Test
LEED AP + Operations and Maintenance Exam - Beta Test

MARCH 2009
LEED AP + Homes Exam - Beta Test

SPRING 2009
LEED Green Associate Exam - Launch
LEED AP + Operations and Maintenance Exam - Launch
LEED AP + Design and Construction/Interior Design and Construction - Beta Test
New Candidate Application

SUMMER 2009
LEED AP + Homes Exam - Launch
LEED AP + Design and Construction/Interior Design and Construction - Launch
New Credentialing Maintenance Program - Launch
LEED-Neighborhood Development
Green Community Rating System

• Integrates the principals of smart growth, new urbanism and green building
• Protect and enhance overall health, natural environment and quality of life of communities
• Serves as a useful, objective design tool
• Uses existing codes and reference standards
• Promotes use of existing infrastructure and provides a foundation for high performance green buildings
• Integrated approach
LEED-ND Categories/Credits

- Prerequisites – 9 prerequisites/No points
  (Prerequisites are spread throughout the categories)

- Smart Location & Linkage – 11 credits/30 points
- Neighborhood Pattern and Design – 16 credits/39 points
- Green Construction & Technology – 20 credits/31 points
- Innovation in Design – 2 credits/6 points

TOTAL – 49 Credits/106 points
LEED Award Levels

- LEED Certified: 40 - 49 Points
- LEED Silver: 50 - 59 Points
- LEED Gold: 60 - 79 Points
- LEED Platinum: 80 - 106 Points
LEED Credit Format & Structure

• Intent
• Credit Requirements
  – Reference Standards
• Technologies/Strategies
LEED Credit Format & Structure

Smart Location & Linkage

SLL Prerequisite 1: Smart Location
Required

Intent

Encourage development within and near existing communities or public transportation infrastructure. Reduce vehicle trips and miles traveled and support walking as a transportation choice. Reduce the risk of obesity, heart disease, and hypertension by encouraging daily physical activity associated with alternative modes of transportation and compact development. Improve the mental health of the community by reducing work commute time and increasing time devoted to leisure, community activities and family.

Requirements

OPTION 1 – INFILL SITE
Locate the project on an infill site;

OR

OPTION 2 – ADJACENT SITE WITH CONNECTIVITY
Locate the project on an adjacent site with pre-project connectivity of at least 150 intersections/sq. mile within a half circle using a radius centered on the midpoint of the adjacent portion of the project perimeter. The radius of the half circle must be ¼ mile, or the length of the adjacent portion of the perimeter, whichever is longer; and
Smart Location & Linkage

SLL Prerequisite 1: Smart Location
Required

Intent

Encourage development within and near existing communities or public transportation infrastructure. Reduce vehicle trips and miles traveled and support walking as a transportation choice. Reduce the risk of obesity, heart disease, and hypertension by encouraging daily physical activity associated with alternative modes of transportation and compact development. Improve the mental health of the community by reducing work commute time and increasing time devoted to leisure, community activities and family.

- Infill Site
- Adjacent Site with Connectivity
- Nearby Adequate Transit
- Nearby Neighborhood Assets
- MPO Location with low VMT
Smart Location & Linkage

SLL Prerequisite 2: Proximity to Water and Wastewater Infrastructure Required

Intent

Encourage new development within and near existing communities in order to reduce multiple environmental impacts caused by sprawl. Conserve natural and financial resources required for construction and maintenance of infrastructure.

- Existing Water and Waste Water Services
- Planned Water & Waste Water Services
Smart Location & Linkage

SLL Prerequisite 3: Imperiled Species and Ecological Communities Required

Intent

Protect imperiled species and ecological communities.

- Perform research with appropriate agencies
- No species present or likely
- Initial consultation inconclusive
- Species found – comply with Habitat Conservation Plan
- Species found: Prepare HCP equivalent
Smart Location & Linkage

SLL Prerequisite 4: Wetland and Water Body Conservation Required

Intent

Conserve water quality, natural hydrology and habitat, and preserve biodiversity through conservation of water bodies or wetlands.

- Previously developed land excluded unless protected, minor improvements in buffers allowed
- No wetlands, water bodies or land within 100 feet thereof;
- Develop to prevent impact on any wetlands or water bodies
- Relief for small projects with significant buffer areas
Smart Location & Linkage

**SLL Prerequisite 5: Agricultural Land Conservation**

**Required**

**Intent**

Reduce the permanent loss of prime agricultural land, especially in places where such land is not abundant. Conserve prime agricultural land for future generations, even if such land is currently covered by forest or otherwise not currently used for food or fiber production.

- No development in Agricultural preservation districts, or compliant with district requirements
- Less than 25% Prime Agricultural Land
- Infill site
- Site served by transit
- Development rights receiving area (TDRs)
- Regions with more than 75% prime agricultural land
Smart Location & Linkage

SLL Prerequisite 6: Floodplain Avoidance

Required

Intent

Protect life and property, promote open space and habitat conservation, and enhance water quality and natural hydrological systems.

- Sites without floodplains
- Infill or previously-developed sites
- All other sites – no development in 100 year floodplain, or use predeveloped areas in compliance with NFIP
Smart Location & Linkage

SLL Credit 1: Preferred Locations
1 to 10 Points

Intent

Encourage development within existing communities and developed places to reduce multiple environmental harms and public health impacts – such as asthma, respiratory diseases, and injuries from motor vehicles – associated with sprawl. Reduce development pressure beyond the limits of existing development. Conserve natural and financial resources required for construction and maintenance of infrastructure. Reduce the risk of obesity, heart disease, and hypertension by encouraging daily physical activity associated with alternative modes of transportation and compact development. Improve the mental health of the community by reducing work commute time and increasing time devoted to leisure, community activities and family.

- Location Type
- Connectivity
- Designated high priority location
Smart Location & Linkage

SLL Credit 2: Brownfields Redevelopment
1 to 2 Points

Intent

Encourage the reuse of land by developing sites where development is complicated by environmental contamination, reducing pressure on undeveloped land.

• Brownfield
• High Priority Brownfield
Smart Location & Linkage

SLL Credit 3: Reduced Automobile Dependence
1 to 8 Points

Intent

Encourage development in locations that exhibit superior performance in providing transportation choices or otherwise reducing motor vehicle use. Reduce public health impacts associated with sprawl, such as asthma, respiratory diseases, and injuries from motor vehicles. Improve the mental health of the community by reducing work commute time and increasing time devoted to leisure, community activities and family.

- Transit-served location
- MPO location with low Vehicle Miles Traveled
Smart Location & Linkage

SLL Credit 4: Bicycle Network and Storage

1 Point

Intent

Promote bicycling and transportation efficiency, and reduce the risk of obesity, heart disease, and hypertension by encouraging daily physical activity. Reduce public health impacts associated with sprawl, such as asthma, respiratory diseases, and injuries from motor vehicles.

- Access to Bicycle network
- Bicycle storage
Smart Location & Linkage

SLL Credit 5: Housing and Jobs Proximity
1 to 3 Points

Intent

Encourage balanced communities with a diversity of uses and employment opportunities. Reduce energy consumption and pollution from motor vehicles by providing opportunities for shorter vehicle trips and/or use of alternative modes of transportation. Reduce risk of obesity, heart disease, and hypertension by encouraging daily physical activity associated with alternative modes of transportation. Reduce public health impacts associated with sprawl, such as asthma, respiratory diseases, and injuries from motor vehicles. Improve the mental health of the community by reducing work commute time and increasing time devoted to leisure, community activities and family.

- Project with affordable residential component – 30% and access to existing jobs
- Project with residential component – 30% and access to existing jobs
- Infill project with non-residential component – 30% sqft, access to transit and existing dwellings for 50% of new jobs
Smart Location & Linkage

SLL Credit 6: Steep Slope Protection

1 Point

Intent

Minimize erosion to protect habitat and reduce stress on natural water systems by preserving steep slopes in a natural, vegetated state.

- No disturbance of slopes over 15% grade
- Previously developed sites – protect slopes over 15%
- Previously developed sites restoring vegetation cover based on slope
- Undeveloped sites with slopes over 15% - top and toe buffers, CC&R protections
Smart Location & Linkage

SLL Credit 7: Site Design for Habitat or Wetland Conservation

1 Point

Intent

Conserve native wildlife habitat, wetlands and water bodies.

- Sites with no significant habitat or wetlands/water bodies
- Sites with significant habitat – additional research and protection planning
- Sites with wetlands/water bodies – additional assessment and protections
Smart Location & Linkage

SLL Credit 8: Restoration of Habitat or Wetlands

1 Point

Intent

Restore native wildlife habitat, water bodies, and wetlands that have been harmed by previous human activities.

- Area equivalent to at least 10% of the development footprint - Using native species only. Protect in perpetuity.
- Earn SLLc 9
Smart Location & Linkage

SLL Credit 9: Conservation Management of Habitat or Wetlands
1 Point

Intent

Conserve native wildlife habitat, wetlands and water bodies.

- Create Management plan (min 10 years) for all existing and new habitat, wetlands and water bodies, with secured financing. Integrated project team to develop plan.
Neighborhood Pattern & Design

NPD Prerequisite 1: Walkable Streets
Required

Intent

Promote walking and bicycling by providing safe, appealing, and comfortable street environments, thus reducing the risk of obesity, heart disease, and hypertension by encouraging daily physical activity. Promote transportation efficiency, including reduced Vehicle Miles Traveled (VMT).

- Principal functional entry of each building has front façade that faces public space, not parking lot;
- >20% of street frontage has building height to street width ratio of 1:3 – alleys excluded, pedestrian RoW counted at 1:1 ratio
- Continuous sidewalks or alternate provisions for walking on both sides of 90% of streets
Neighborhood Pattern & Design

NPD Prerequisite 2: Compact Development

Required

Intent

Conserve land. Promote livability, walkability, and transportation efficiency including reduced vehicle miles traveled (VMT). Reduce risk of obesity, heart disease, and hypertension by encouraging daily physical activity associated with alternative modes of transportation and compact development.

- Projects with transit service (Earning at least 2 pts in SLLc3 option 1) Residential: ≥ 12 units/acre of buildable land. Non-residential: ≥ 0.8 FAR for non-residential land area
- All other projects - Residential: ≥ 7 units/acre of buildable land. Non-residential: ≥ 0.5 FAR for non-residential land area
- Include all planned and existing buildings, except parking structures
Neighborhood Pattern & Design

NPD Prerequisite 3: Connected and Open Community Required

Intent

Promote communities that are physically connected to each other. Foster community and connectedness beyond the development. Encourage the design of projects in existing communities in order to conserve land, promote multimodal transportation choices, promote public health through increased physical activity, and promote transportation efficiency include reduced Vehicle Miles Traveled (VMT).

• One through street or non-motorized vehicle RoW intersecting project boundary every ≤ 800 ft or existing abutting street intervals – except where physically obstructed
• Projects with internal streets – connectivity of 150 intersections/square mile or more
• Projects without internal streets – connectivity within ¼ mile is 90 intersections/sq mile or more
Neighborhood Pattern & Design

NPD Credit 1: Walkable Streets
1 to 12 Points

Intent

Promote walking and bicycling by providing safe, appealing, and comfortable street environments, thus reducing the risk of obesity, heart disease, and hypertension by encouraging daily physical activity. Promote transportation efficiency, including reduced Vehicle Miles Traveled (VMT).

- **Multiple items to earn points**
  - Facades & Entries – Proximity of facades to property line, or contiguous to the sidewalk; frequency of building entries along non-residential and mixed use buildings or blocks
  - Ground-level use and Parking – Ground level uses that face public space have clear glass on 60% of façade; no extended blank walls along sidewalks; ground level windows kept visible at night (in CC&Rs); on-street parking on at least 70% of both sides of street; continuous sidewalks or equivalent on both sides of all streets; 50% of ground floor dwelling units must have elevated finish floor (24” above street); ground level retail and services in non-residential and mixed use; at least 40% of street frontage have building height to street width ratio of 1:3;
  - Design speed for safe pedestrian and bicycle travel – 75% of residential streets have design speed of no more than 20mph; 70% of non-residential streets have design speed of no more than 25mph
Neighborhood Pattern & Design

NPD Credit 2: Compact Development
1 to 6 Points

Intent

Conserve land. Promote livability, walkability, and transportation efficiency including reduced Vehicle Miles Traveled (VMT). Reduce risk of obesity, heart disease, and hypertension by encouraging daily physical activity associated with alternative modes of transportation and compact development.

<table>
<thead>
<tr>
<th>Residential Density (DU/acre)</th>
<th>Non-residential Density (FAR)</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 10 and ≤ 13</td>
<td>&gt; 0.75 and ≤ 1.0</td>
<td>1</td>
</tr>
<tr>
<td>&gt; 14 and ≤ 18</td>
<td>&gt; 1.0 and ≤ 1.25</td>
<td>2</td>
</tr>
<tr>
<td>&gt; 19 and ≤ 25</td>
<td>&gt; 1.25 and ≤ 1.75</td>
<td>3</td>
</tr>
<tr>
<td>&gt; 26 and ≤ 38</td>
<td>&gt; 1.75 and ≤ 2.25</td>
<td>4</td>
</tr>
<tr>
<td>&gt; 39 and ≤ 63</td>
<td>&gt; 2.25 and ≤ 3.0</td>
<td>5</td>
</tr>
<tr>
<td>&gt; 64</td>
<td>&gt; 3.0</td>
<td>6</td>
</tr>
</tbody>
</table>
Neighborhood Pattern & Design

NPD Credit 3: Diversity of Uses

1 to 4 Points

Intent

Conserve land. Promote livability, walkability, and transportation efficiency including reduced Vehicle Miles Traveled (VMT). Reduce risk of obesity, heart disease, and hypertension by encouraging daily physical activity associated with alternative modes of transportation and compact development.

<table>
<thead>
<tr>
<th>Number of uses</th>
<th>Percent of project total sq. ft. occupancy at which uses must be in place</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 – 6</td>
<td>20%</td>
<td>1</td>
</tr>
<tr>
<td>7 – 10</td>
<td>30%</td>
<td>2</td>
</tr>
<tr>
<td>11 – 18</td>
<td>40%</td>
<td>3</td>
</tr>
<tr>
<td>≥ 19</td>
<td>50%</td>
<td>4</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Number of Uses</th>
<th>Minimum Number of Uses in a Neighborhood Center</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 – 6</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>7 – 10</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>11 – 18</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>19 or more</td>
<td>9</td>
<td>4</td>
</tr>
</tbody>
</table>

Large Retail Centers must also earn additional points from SLLc3 – Reduced auto dependence.
Neighborhood Pattern & Design

NPD Credit 4: Mixed-Income Diverse Communities
1 to 7 Points

Intent

Promote socially equitable and socially engaging communities by enabling citizens from a wide range of economic levels, household sizes, and age groups to live within a community. Promote architectural diversity.

- Diversity of Housing Types – Detached, townhouse, multi-family, live-work, etc. – See tables
- Affordable Housing – % of Rental and For Sale units, by % of AMI. See table
- Mixed Income Diverse communities – If project earns at least 2 points in each of Option 1 and Option 2, an additional point is earned
Neighborhood Pattern & Design

NPD Credit 5: Reduced Parking Footprint
1 Point

Intent

Design parking to increase the pedestrian orientation of projects and to minimize the adverse environmental effects of parking facilities. Reduce risk of obesity, heart disease, and hypertension by encouraging daily physical activity associated with alternative modes of transportation.

• Any new off-street parking should be to the side or behind buildings; and
• No more than 20% of development footprint for new off-street parking, and no lot bigger than 2 acres; and
• Provide bicycle parking and storage capacity, amount based on building type; and
• Provide Carpool parking for non-residential and mixed use buildings, with signage and within 200ft of entrances
Neighborhood Pattern & Design

NPD Credit 6: Street Network
1 to 2 Points

Intent

Encourage the design of projects that incorporate high levels of internal connectivity and the location of projects in existing communities in order to conserve land, promote multimodal transportation and reduce the risk of obesity, heart disease, and hypertension by encouraging daily physical activity. Reduce public health impacts such as asthma, respiratory diseases, and injuries from motor vehicles associated with sprawl. Improve the mental health of the community by reducing work commute time and increasing time devoted to leisure, community activities and family.

- Pedestrian/bicycle through connections in 90% of cul-de-sacs; and
- Increase internal and adjacent connectivity (300 or 400 intersections per sq mile); and
- Through street at least at every 400 feet of project boundary or at abutting street intervals, if smaller
Neighborhood Pattern & Design

NPD Credit 7: Transit Facilities
1 Point

Intent

Encourage transit use and reduce driving by creating safe and comfortable transit facilities.

- Covered, partially enclosed, adequately lit shelters with benches at all transit stops; and
- Kiosks, bulletin boards and/or signs providing transit schedule and route information; and
- Confirm each stop has adequate transit service

Minimum daily trips for weekdays and weekends, based on transit type
Neighborhood Pattern & Design

NPD Credit 8: Transportation Demand Management
1 to 2 Points

Intent

Reduce energy consumption, pollution from motor vehicles, and public health impacts such as asthma, respiratory diseases, and injuries from motor vehicles by encouraging use of public transit.

- TDM Program – reduce weekday peak motor vehicle trips by 20% below forecast
- Transit Passes – Minimum 12 month pass at min 50% discount to residents, employees and students during at least the first 3 years of project occupancy
- Developer-sponsored transit – provide year round transit from at least one central point to adjacent transit facilities (at least 75% of Adequate Transit Service levels
- Vehicle Sharing – 50% of dwelling units within ¼ mile of vehicle-sharing location
Neighborhood Pattern & Design

NPD Credit 9: Access to Public Spaces

1 Point

Intent

To provide a variety of open spaces close to work and home to encourage walking, physical activity and time spent outdoors. Reduce risk of obesity, heart disease, and hypertension by encouraging daily physical activity through access to public spaces. Improve the mental health of the community by providing a variety of open spaces close to work and home. Promote socially equitable and socially engaging communities by providing appealing and comfortable spaces for social networking, civic engagement, personal recreation, and other activities that create social bonds between individuals and groups.

- Park, school yard or plaza of >1/6 acre within ¼ mile of 90% of dwelling units and business entrances. Parks less than 1 acre must be no narrower than 1 width:4 length
- Projects larger than 7 acres: average size of parks within/contiguous with project is at least ½ acre
Neighborhood Pattern & Design

NPD Credit 10: Access to Active Public Spaces
1 Point

Intent

To provide a variety of open spaces close to work and home to encourage walking, physical activity and time spent outdoors. Reduce risk of obesity, heart disease, and hypertension by encouraging daily physical activity through access to active public spaces. Improve the mental health of the community by providing a variety of open spaces close to work and home. Promote socially equitable and socially engaging communities by providing appealing and comfortable spaces for social networking, civic engagement, personal recreation, and other activities that create social bonds between individuals and groups.

- Active public facilities totaling at least 1 acre, or indoor recreational facility within ½ mile walk of 90% of dwellings and/or business entrances
Neighborhood Pattern & Design

NPD Credit 11: Universal Accessibility

1 Point

Intent

Enable the widest spectrum of people, regardless of age or ability, to more easily participate in their community life by increasing the proportion of areas that are usable by people of diverse abilities.

• Projects with a residential component: For each dwelling type, 20% of dwellings comply with accessible housing provisions (Fair Housing Amendments and Rehabilitation Acts)
  – For any common use or recreational facilities, apply accessible design provisions to facilities and RoW
  – For any non-res areas, apply ADA provisions to facilities and RoW

• Non-residential projects with common use facilities: Achieve Common-use requirements of Option 1.
  – Non-res projects without common-use facilities MUST comply with ADA by law, so cannot earn points for this credit
Neighborhood Pattern & Design

NPD Credit 12: Community Outreach and Involvement
1 to 2 Points

Intent

Promote socially equitable and socially engaging communities by encouraging community participation in the project design and planning and by involving the people who live or work in a community in deciding how it should be improved or how it should change over time.

- **Community Outreach** –
  - Meet with neighbors and public officials to solicit input prior to design; and
  - Host an open community meeting during conceptual design; and
  - Modify conceptual design based on community input or explain why not; and
  - Work with community associations and local govt to promote public meetings and generate comments on design; and
  - Establish ongoing communication between developer and community throughout design and construction – and post-construction where appropriate

- **Charrette**: Comply with Option 1 and conduct a design charrette over at least 4 days that includes citizen preparation of conceptual plans and drawings
Neighborhood Pattern & Design

NPD Credit 13: Local Food Production

1 Point

Intent

Promote community-based and local food production to minimize the environmental impacts and public health impacts – such as asthma, respiratory diseases, and injuries from motor vehicles – from transporting food long distances. Reduce the risk of cancer and other chronic diseases by increasing direct access to fresh foods.

- Do not restrict the growing of produce on lots or buildings in CC&Rs, etc. (can restrict greenhouses in front yards); and
- Dedicate permanent and viable growing space (community pea patches) per dwelling, based on density. Existing adjacent community gardens within ¼ mile of project center will comply
- Community supported agriculture – Purchase shares in a CSA program for at least 80% of the households for 2 years
- Proximity to Framers Market – Within ¼ mile walk of existing or planned Farmers Market, or design a market that will operate at least 5 months of year
Neighborhood Pattern & Design

NPD Credit 14: Tree-Lined and Shaded Streets
1 to 2 Points

Intent


- Tree lined streets – Street trees on both sides of 70% of streets at 40ft intervals
- Shaded streets – Trees or other structures shade at least 40% of sidewalks. Measure tree shading at 5-years growth from installation
- For all – trees in non-res street planted in root-friendly medium (structural soil). Res streets have planting strips wide enough to provide healthy growing area
Neighborhood Pattern & Design

NPD Credit 15: Neighborhood Schools

1 Point

Intent

Promote community interaction and engagement. Reduce risk of obesity, heart disease, and hypertension by encouraging daily physical activity associated with alternative modes of transportation, such as walking or biking.

- Residential at least 25% of project footprint, 50% of dwellings within ½ mile walk of existing or planned school (planned school to be provided before 50% occupancy is reached); and

- Planned school campus size limits:
  - High – 10 acres
  - Middle – 8 acres
  - Elementary – 5 acres
  - Mixed grades use higher threshold
Green Infrastructure & Buildings

GIB Prerequisite 1: Certified Green Building
Required

Intent

Encourage the design, construction or retrofit of buildings to utilize green building practices.

- Design, construct or retrofit one whole building certified under the appropriate LEED Rating System
Green Infrastructure & Buildings

GIB Prerequisite 2: Minimum Building Energy Efficiency

Required

Intent

Encourage the design and construction of energy efficient buildings to reduce air, water, and land pollution and environmental impacts from energy production and consumption.

- Non-residential, mixed use and multi-family buildings over 4 stories must (on average) exceed ASHRAE 90.1-2007 by 10% (5% for renovations);
- Residential (SF and MF 3 stories or less) – 90% must meet Energy Star or equivalent criteria
Green Infrastructure & Buildings

GIB Prerequisite 3: Minimum Building Water Efficiency Required

Intent

Minimize water use in buildings to reduce the impact to natural water resources and reduce the burden on municipal water supply and wastewater systems.

- Non-residential and large MF buildings – 20% reduction in water consumption
- Residential – 90% of buildings must use a combination of fixtures that would earn 3 points in WE3 LEED for Homes 2008
Green Infrastructure & Buildings

GIB Prerequisite 4: Construction Activity Pollution Prevention

Required

Intent

Reduce pollution from construction activities by controlling soil erosion, waterway sedimentation and airborne dust generation.

- Erosion and Sedimentation Control Plan
  - Prevent loss of soil through water and wind erosion, including stockpiled soils
- Prevent sedimentation of stormwater conveyances and receiving streams
- Prevent air pollution with dust and particulates
Green Infrastructure & Buildings

GIB Credit 1: Certified Green Buildings
1 to 5 Points

Intent

Encourage the design, construction, and retrofit of buildings to utilize green building practices.

- **Projects with 10 or fewer habitable buildings**
  - One to 5 LEED certified Buildings, or

- **Projects of all sizes**
  - One point for each 10% of buildings LEED certified – up to 50%

- **Detached accessory dwelling units must be counted as separate buildings**
Green Infrastructure & Buildings

GBI Credit 2: Building Energy Efficiency
1 to 2 Points

Intent

Encourage the design and construction of energy efficient buildings to reduce air, water, and land pollution and environmental impacts from energy production and consumption.

- 90% of new non-rez and large MF buildings – 24% better than ASHRAE 90.1
- 90% of Residential buildings achieve a HERS index of at least 75
Green Infrastructure & Buildings

GIB Credit 3: Water Efficient Landscaping

1 Point

Intent

Limit or eliminate the use of potable water, or other natural surface or subsurface water resources available on the project site, for landscape irrigation.

- Reduce potable water consumption for irrigation by 50%
  - Plant selection
  - Irrigation efficiency
  - Non-potable water
Green Infrastructure & Buildings

GIB Credit 4: Existing Building Reuse

1 Point

Intent

Extend the life cycle of existing building stock, in order to conserve resources, reduce waste, and reduce environmental impacts of new buildings as they relate to materials manufacturing and transport.

- No historic building (listed or found to be eligible) may be demolished as part of the project – exceptions if approved by appropriate body; and
- Reuse existing building stock – based on surface area:
  - 50% of one existing building;
  - 20% of total existing building stock
Green Infrastructure & Buildings

GIB Credit 5: Historic Building Preservation and Adaptive Use
1 Point

Intent

Encourage the preservation and adaptive use of historic buildings, which represent significant embodied energy and cultural value, in a manner that preserves their historic materials and character-defining features.

• No historic building (listed or found to be eligible) may be demolished as part of the project – exceptions if approved by appropriate body; and

• Approval from local historic preservation commission, etc.

• Confirmation from State Historic Preservation office
Green Infrastructure & Buildings

GIB Credit 6: Minimize Site Disturbance In Design and Construction

1 Point

Intent

Preserve existing tree canopy, native vegetation and pervious surfaces while encouraging high density, smart growth communities.

- Development footprint on previously developed land
- Undeveloped portion of project remains undisturbed – based on density
- Survey and protect Heritage or Champion trees, 75% of non-invasive trees over 18” DBH, and 25% over 12 deciduous, 6” conifers
- Develop tree health plan with arborist

<table>
<thead>
<tr>
<th>Residential Density (DU/acre)</th>
<th>Non-Residential Density (FAR)</th>
<th>Minimum percent of previously undeveloped area to leave undisturbed</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 15</td>
<td>&lt; .50</td>
<td>20%</td>
</tr>
<tr>
<td>15-21</td>
<td>.50 – 1.00</td>
<td>15%</td>
</tr>
<tr>
<td>&gt; 21</td>
<td>&gt; 1.0</td>
<td>10%</td>
</tr>
</tbody>
</table>
Green Infrastructure & Buildings

GIB Credit 7: Stormwater Management
1 to 4 Points

Intent

Reduce pollution and hydrologic instability from stormwater, prevent flooding, and promote aquifer recharge through the emulation of undeveloped natural hydrological conditions.

- Implement Low Impact Development Stormwater Management plan – infiltrate, reuse or evapotranspire runoff – based on % of storm events to be retained
- Additional points if previously developed, brownfield or transit-ready

<table>
<thead>
<tr>
<th>Points earned</th>
<th>TABLE 1: Targeted Percentage of storm events to be retained</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>80%</td>
</tr>
<tr>
<td>2</td>
<td>85%</td>
</tr>
<tr>
<td>3</td>
<td>90%</td>
</tr>
<tr>
<td>4</td>
<td>95%</td>
</tr>
</tbody>
</table>
Green Infrastructure & Buildings

GIB Credit 8: Heat Island Reduction
1 Point

Intent

Reduce heat islands to minimize impact on microclimate and human and wildlife habitat.

- Non-roof measures – shade 50% of non-roof impervious surfaces (Not awnings or buildings)
- Covered off-street parking – 50% of off-street parking
- High reflectance roofs – 75% of roof – SRI: Low slope 78, Highslope 29
- Vegetated roofs – minimum 50% of roof area
- Combined vegetated and high reflectance – 75%
Green Infrastructure & Buildings

G1B Credit 9: Solar Orientation

1 Point

Intent

Achieve enhanced energy efficiency by creating the optimum conditions for the use of passive and active solar strategies.

- Block Orientation – for projects earning at least 2 points under NPDc2: Compact Development) – Orient 75% of blocks to have long axis within 15 degrees of geographical east/west
- Building orientation – for all projects: 75% of building square footage with long axis (1.5:1) within 15 degrees of geographical east west
Green Infrastructure & Buildings

GIB Credit 10: On-Site Renewable Energy Sources
1 to 3 Points

Intent

Encourage on-site renewable energy self-supply in order to reduce environmental and economic impacts associated with fossil fuel energy use.

<table>
<thead>
<tr>
<th>Percentage of annual electrical and thermal energy cost</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>12.5</td>
<td>2</td>
</tr>
<tr>
<td>20</td>
<td>3</td>
</tr>
</tbody>
</table>
Green Infrastructure & Buildings

GIB Credit 11: District Heating & Cooling

2 Points

Intent

Reduce air, water, and land pollution resulting from energy consumption in buildings by employing energy efficient district technologies.

- 80% of building square footage (at least 2 buildings) – meeting 80% peak heating/cooling load
- At least 10% better than ASHRAE 90.1
Green Infrastructure & Buildings

GIB Credit 12: Infrastructure Energy Efficiency
1 Point

Intent

Reduce air, water, and land pollution from energy consumption.

• Traffic lights, street lights, water pumps and treatment systems at least 15% more efficient than lowest first cost option
Green Infrastructure & Buildings

GIB Credit 13: Wastewater Management
1 to 3 Points

Intent

Reduce pollution from wastewater and encourage water reuse.

- Onsite waste water treatment

<table>
<thead>
<tr>
<th>Percentage of Wastewater Reused</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>1</td>
</tr>
<tr>
<td>50</td>
<td>2</td>
</tr>
<tr>
<td>75</td>
<td>3</td>
</tr>
</tbody>
</table>
Green Infrastructure & Buildings

GIB Credit 14: Recycled Content in Infrastructure
1 Point

Intent

Use recycled materials to reduce the environmental impact of extraction and processing of virgin materials.

- 90% of Aggregate
- 15% of any asphalt base
- 15% asphalt pavement, or other options
- 25% recycled cementitious content
Green Infrastructure & Buildings

GIB Credit 15: Waste Management Infrastructure
1 Point

Intent
Reduce the waste hauled to and disposed of in landfills. Promote proper disposal of office and household hazardous waste streams.

• Mark storm drains to discourage dumping
• Recycling stations, drop offs
• Composting stations
Green Infrastructure & Buildings

GIB Credit 16: Light Pollution Reduction
1 Point

Intent

Minimize light trespass from site, reduce sky-glow to increase night sky access, improve nighttime visibility through glare reduction, and reduce development impact on nocturnal environments.

- Only light shared areas for safety and comfort
- Stipulate requirements in CC&Rs
- Document lighting Zones
- Comply with IESNA Roadway lighting requirements
Innovation & Design Process

IDP Credit 1: Innovation and Exemplary Performance
1 to 5 Points

Intent

To provide projects the opportunity to be awarded points for exceptional performance above the requirements set by the LEED for Neighborhood Development Rating System and/or innovative performance in green building, smart growth, or new urbanist categories not specifically addressed by the LEED for Neighborhood Development Rating System.
Innovation & Design Process

IDP Credit 2: LEED Accredited Professional
1 Point

Intent

To support and encourage the planning and design integration required by a LEED for Neighborhood Development green neighborhood project and to streamline the application and certification process.