LEED-ND
Can Smart Growth Address Peak Oil?

New Partners for Smart Growth
Denver Colorado
January 25, 2006

What is LEED-ND?


- Joint venture of USGBC, CNU, NRDC (SG)
- national certification for “smart” development
- Primary market: developers
- Other possible users : planners & local governments

What else is LEED-ND?


- Entire developments of multiple buildings and developer-supplied infrastructure
- May be mixed-use, or entirely residential or commercial if adding diversity to surrounding area
- Will likely inform land-use component of other LEED rating systems

Who are we? Where are we?

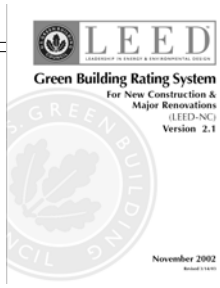
- Middle of third year of four-year + process to develop standards
- About to begin pilot phase to field test standards
- "Core Committee" makes the final decisions
- "Corresponding Committee" reviews, comments

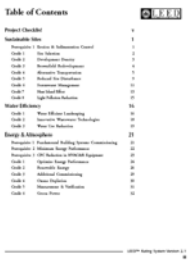
What's the product?

The LEED-ND Rating System, which will have:

- Standards in categories
- Some prerequisites
- Point system with credits for attributes beyond the prerequisites
- Levels of certification depending on points earned (Certified, Silver, Gold, Platinum)

LEED as you (may) know it . . .





How does LEED-ND address energy use?

Through three of its four categories:

- Location Efficiency
- Environmental preservation
- Compact, complete and connected Neighborhoods
- Resource efficiency

How does the built environment contribute to climate change?

- Energy use associated with the building:
  - Heating & cooling
  - Water heating
  - Appliances & lighting
  - Energy producing and transporting of materials
- Energy use associated with planning and neighborhood design:
  - Mode choice
  - Distance traveled

U.S. CO_2 Emissions Buildings vs. Transportation

Transportation	484.9 m.tons	32.6%
Residential	284.5 m.tons	19.0%
Commercial	238.4 m.tons	15-16%
Buildings Subtotal		34-5%

Oak Ridge Labs

Transportation is the fastest growing sector

Location Efficiency

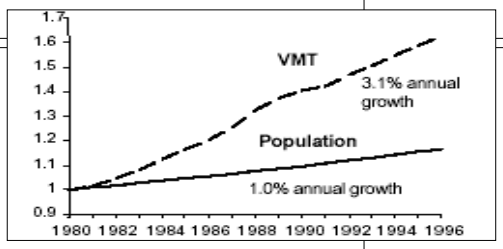
- Infill and redevelopment sites
- Transit served locations
- Transit amenities

U.S. Vehicle Miles Traveled

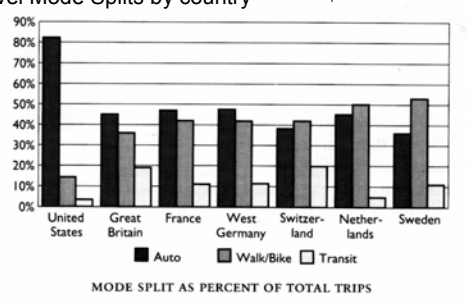
- **Licensed Drivers: 190,000,000**
- **Registered Cars : 130,000,000**
- **2000 U.S. VMT: 2,700,000,000,000 Miles**
- **Vmt increase from 1980 to 1997: 68%**
- **One Light Year: 5,800,000,000,000 Miles**

Source: FHWA, Highway Statistics 2000

Growth in VMT and Population



Travel Mode Splits by country



Source: The Next American Metropolis by Peter Calthorpe

Land Use/Transportation Linkage

(by Family)

	Average Lot Size	Units Per Sq. Mile	Avg. # of Autos	Avg. Annual Vehicle Miles
City	**.02 acres**	**32,000**	**<1**	**8,000**
Inner-Ring Suburb	0.125 acres	5,120	1-2	15,000
Outer-Ring Suburb	1 acre	640	2-3	27,500
Exurb	**5 acres**	**128**	**3+**	**30,000**

The Wealth of Cities, John Norquist

~~Prerequisite 1.01:~~ Location Efficiency

Intent:

Encourage development in locations that reduce automobile dependence. Reduce air pollution, energy consumption, and greenhouse gas emissions generated by transportation. Promote public health through increased physical activity.

Requirements:

(1) Locate the project on an Infill or Redevelopment Site,

OR

(2) Locate the project near exisiting Transit Service,

OR

(3) Locate the project near planned Transit Service,

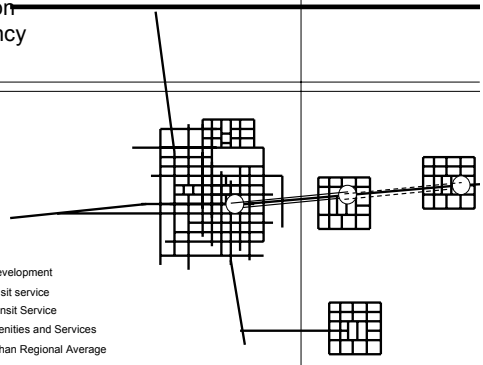
OR

(4) Locate project near existing amenities and services

OR

(5) Locate project in a zone where driving rates are less than the average rate for residents of the metropolitan region.

Prerequisite 1.01: Location Efficiency



Infill or Redevelopment
Existing transit service
Planned Transit Service
Existing Amenities and Services
Drive Less than Regional Average

Credit 1.03: Reduced Automobile Dependence

Intent:
Encourage development in locations that exhibit superior performance in providing transportation choices or otherwise reducing motor vehicle use. Reduce consumption, pollution, and household financial burdens associated with motor vehicle use.

Requirements:
Locate project on a site that has either
Outstanding transit service,
OR
Outstanding performance on travel behavior,

1.0 Location Efficiency

6 points

Credit 1.04: Carshare Available

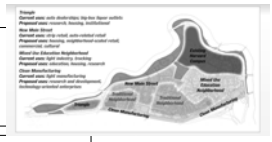
Intent:
Reduce resource consumption and household financial burdens associated with automobile ownership.

Requirements:
Locate project such that a carshare program (such as Zipcar or Flexcar) with on-site vehicles is available within ½ mile of a majority of dwelling units and business entrances in the project,
or
provide a carshare program within the project.

1.0 Location Efficiency

1 point

Credit 1.05: Contribution to Jobs-Housing Balance



Intent:

Encourage balanced communities with a diversity of uses and opportunities. Reduce energy consumption and pollution from motor vehicles by providing opportunities for shorter vehicle trips and/or use of alternative modes of transportation.

Requirements:

Locate the project within a designated distance of a number of pre-development jobs equal to or greater than 50% of the number of dwelling units in the project.

1.0 Location Efficiency

4 points

Credit 1.06: School Proximity

Intent:

Promote children's health through physical activity. Promote a sense of community.

Requirements:

Include a residential component as part of the project,

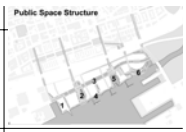
AND

Locate project so that it borders a public school or at least half of its residences are within ¼ mile of a public school. The school must be reachable from the residences via unobstructed sidewalks.

1.0 Location Efficiency

1 point

Credit 1.07: Access to Public Space



Intent:

Provide access to public gathering space in order to promote sense of community.

Requirements:

Locate and/or design project such that a public space of some sort (including parks, plazas, town square, village green, etc.) lies within ½ mile of the all the entrances to the project's residential and commercial buildings.

1.0 Location Efficiency

1 point

Compact, complete, and connected neighborhoods

- Density
- Mix/Proximity of uses
- Pedestrian friendliness, street connectivity
- Historic preservation, character
- Access to green space
- Diverse and Affordable housing

Neighborhood Diagram

10-40% Trip Capture (reduction) with a critical mass of Pedestrian Destinations

Potential Energy Savings from Location Efficiency (Density)

Residential Units per Net Residential Acre	Gallons of Gas Saved	Mbtu Saved from Location Efficiency
6	223	27.89
12	403	50.40
20	512	64.04
36	618	77.29
50	670	83.80
100	762	95.30
500	913	114.19

Prerequisite 3.02: Compact Development

Intent:
Promote livability, transportation efficiency, and walkability.
Conserve land.

Requirements:
Build residential components of project at an average density of seven or more dwelling units per acre of Buildable Land available for residential use,
AND
Build commercial components of project at a floor area ratio of 0.75 or greater.

3.0 Compact, Complete & Connected Neighborhood(s)

Prerequisite 3.03: Internal Connections

3.0 Compact, Complete & Connected Neighborhood(s)

Credit 3.01: Compact Development

Intent:
Promote community livability, transportation efficiency, and walkability. Conserve land.

Requirements:

- Design and build project such that one of the following average densities is achieved:
  - 14 dwelling units per acre (1 credit)
  - 18 dwelling units per acre (2 credits)
  - 22 dwelling units per acre (3 credits)
  - 26 dwelling units per acre (4 credits)
  - 30 dwelling units per acre (5 credits)

3.0 Compact, Complete & Connected Neighborhood(s) 6 points

Credit 3.02: Location with Outstanding Neighborhood Completeness (Diversity of Uses)

Intent:

Promote community livability, transportation efficiency, and walkability.

Requirements:

Build and design the project such that it includes a residential component AND consists of no more than 80% by interior square footage of any single Use Type.

OR

Locate project such that its boundary is located within ¼ mile of at least six OR within ½ mile of at least eight community amenities or services.

3.0 Compact, Complete & Connected Neighborhood(s)

6 points

Credit 3.08: Designing and Locating Buildings to Shape Walkable Streets

Intent:

Reduce VMT, protect privacy at higher densities and reinforce community identity by positioning buildings to offer the community's occupants safe, comfortable streets and public spaces.

Requirements:

Design and build project such that:

the fronts of all buildings face streets;
AND
all homes are no more than 18' from front property line;
AND
a majority of ground-floor dwelling units have an elevated finished floor no less than 30" above the sidewalk grade;
AND
the majority of mixed-use and commercial buildings are adjacent to the sidewalk,
AND
ground level non-residential buildings have storefront glazing,
AND
no blank walls are constructed along sidewalks;
AND
CC&Rs require that owner will keep ground level non-residential spaces unshuttered and lit from within at night.

3.0 Compact, Complete & Connected Neighborhood(s)

4 points

Credit 3.10: Transit Subsidy

Intent:

Reduce energy consumption and pollution from motor vehicles by encouraging use of public transit.

Requirements:

Provide transit passes, subsidized to be half of regular price or cheaper, for residents and employees located within the project for at least one year,

OR

Provide regular transit service (with vans, shuttles, buses) to rail, ferry, or other major transit facilities and/or another major destination such as a retail or employment center. Guarantee service for at least one year.

3.0 Compact, Complete & Connected Neighborhood(s)

3 points

Credit 3.11: Transit Amenities

Intent:

Reduce energy consumption and pollution from motor vehicles by encouraging use of public transit.

Requirements:

Provide covered and at least partially enclosed shelters (adequate to buffer wind) with at least one bench are provided at transit stops within the project boundaries.

OR

Provide kiosks, bulletin boards, and/or signs devoted to providing local transit information as part of the project, including basic schedule and route information at each transit stop that borders or falls within the project.

3.0 Compact, Complete & Connected Neighborhood(s)

1 point

Credit 3.12: Access to Nearby Communities

Intent:

Encourage development that is physically connected to its surroundings. Reduce traffic congestion, energy consumption and pollution from motor vehicles by enabling more efficient travel. Promote public health through increased walkability.

Requirements:

- Design and build project such that at least three street connections are provided between the project and adjacent existing streets.

3.0 Compact, Complete & Connected Neighborhood(s)

2 points

Resource Efficiency

- Green building design
- Building Energy Efficiency
- Heat island reduction (roof & non-roof)
- Construction waste management
- Locally provided materials
- On-site power generation
- Compost/recycling facilities

Potential Energy Savings: Density vs. EnergyStar

Residential Units per Net Residential Acre	Gallons of Gas Saved	Mbtu Saved from Location Efficiency
6	223	27.89
12	403	50.40
20	512	64.04
36	618	77.29
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500	913	114.19

	Average Mbtu Savings from EnergyStar Recommendations
Minimum	9.3
Average	25.2
Maximum	40.1

Urban and Suburban Energy Use per Household

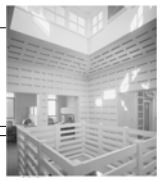
FIGURE 1.10
URBAN vs. SUBURBAN ENERGY USE PER HOUSEHOLD

		Urban Families			Suburban Families		
		Energy (MMBtu/yr	Cost ($/yr)	CO_2 (tons/yr)	Energy (MMBtu/yr	Cost ($/yr)	CO_2 (tons/yr)
Household (2.5 persons)	Travel	80	910	6	140	1,670	11
	Home	100	1,220	12	110	1,340	14
	Community fraction*	140	1,650	21	190	2,280	29
		320	3,780	39	440	5,290	54

* Community fraction includes household share of all non-residential energy use and community infrastructure energy use.
Source: See Figure 1.13.

Source: "The Energy Yardstick, Using PLACE3S to Create More Sustainable Communities." Center of Excellence for Sustainable Development, EERE, U.S. DOE. 1996.

Credit 4.01: Green Building Design



Intent:
Encourage the design and construction of buildings to utilize green building practices.

Requirements:
Design and construct 10% of buildings that are part of the project to be LEED certified under one of the other LEED building-centric rating systems: LEED-NC (New Construction), LEED-H (Homes), LEED-CS (Core & Shell). Previously existing buildings that are part of the project certified as LEED-EB (Existing Buildings) may also be included to meet the requirement.

Additional credit for percentages of LEED-certified buildings available.

5 points

Credit 4.02:
Minimum Building Energy Efficiency

Intent:

A minimum portion of buildings to achieve Energy Star status.

Requirement:

Reduce energy consumption by establishing a system energy budget,

AND

Stipulate CC&Rs or other binding documents requiring the components of the project as an aggregate to meet the maximum allowable energy requirement established by the budget.

4.0 Resource Efficiency

3 points

Credit 4.04:
Roof Heat Island Reduction

Intent:

Reduce heat island effect (thermal gradient differences between developed and undeveloped areas) to minimize impact on microclimate, human and wildlife habitat, and required energy for cooling.

Requirements:

Use Energy Star® compliant (highly reflective) AND high emissivity roofing for a minimum of 75% of the roof surface of all buildings within the project; OR install a "green" (vegetated) roof for a least 50% of the roof area of all buildings within the project. Combinations of high albedo and vegetated roof can be used providing the collectively cover 75% of the roof area of all buildings.

AND

Stipulate in CC&Rs or other binding documents that roof heat island requirements will be met for each development phase.

4.0 Resource Efficiency

1 point

Credit 4.05:
Infrastructure Energy Efficiency

Intent:

Reduce (air, water, land) pollution from energy consumption.

Requirement:

For common or public amenities (street lights, lift stations, traffic lights), design or purchase equipment to comply with the appropriate equivalent of ASHRAE/IESNA Standards or the local energy code, whichever is more stringent;

OR

benchmark energy use of conventional equipment and reduce consumption.

4.0 Resource Efficiency

1 point

Credit 4.06: On-Site Power Generation

Intent:

Reduce (air, water, land) pollution from energy consumption by increasing the efficiency of the power delivery system. Increase the reliability of power.

Requirements:

Develop, or incorporate into future project build out through CC&Rs or other binding documents, on-site source(s) of power generation sufficient to meet 5% (1 point) / 10% (2 points) / 20% (3 points) of the energy the needs of the total project.(all building uses and commonly owned infrastructure).

4.0 Resource Efficiency

1-3 points

Credit 4.07: On-Site Renewable Energy Sources

Intent:

Reduce environmental impacts associated with fossil fuel energy generation by increasing the use of on-site renewable energy sources.

Requirements:

Design and specify, or incorporate into future project build out through CC&Rs other binding documents, the use of shared on-site nonpolluting renewable energy generation technologies such as solar, wind, geothermal, low-impact hydroelectric, and biomass to supply at least 5% (1 point) / 10% (2 points) / 20% (3 points) of the total energy used by the project (all building uses and commonly owned infrastructure).

4.0 Resource Efficiency

1 point

Credit 4.12: Locally Provided Materials

Intent:

Promote selection of locally available materials and resources to build local economy and reduce embodied energy.

Requirements:

Build common and public infrastructure (e.g., sidewalks, roads, grading subbase, paving, curbs, sewers) such that a minimum of 20% (1 point) / 50% (2 points) of materials used are manufactured, extracted, harvested or recovered regionally within a radius of 500 miles.

4.0 Resource Efficiency

1-2 points

LEED-ND
Pilot Program to start spring 2006
Unknown number of pilots (10 - 100)
Seeking diverse projects to test the system

Download standard at cnu.org

Thank you