

Sustainable Urban Environments,
US Green Building Council,
And
LEED for Neighborhood Development
Overview

Presented to
Loyola's Environmental Sustainability Class
September 18th & 19th 2008

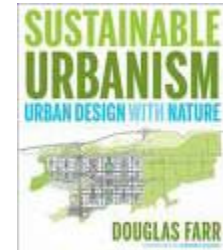
Agenda

- Sustainable Urban Environments
 - Definition
 - Organizations
 - Macro Level Statistics / Trends
 - Positive Societal Impacts

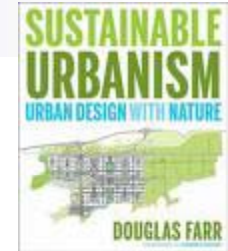
- US Green Building Council (USGBC)

- LEED for Neighborhood Development Rating System (LEED ND)

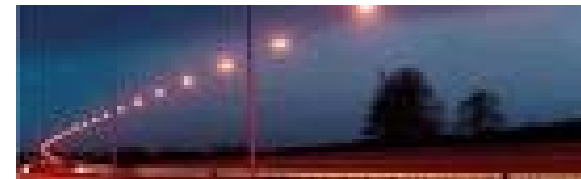
- Quiz: Don't worry – It's not being graded or turned in.



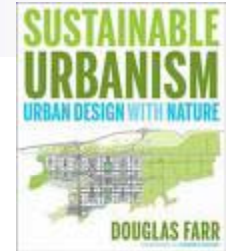
Sustainable Urban Environments



- Sustainable Urbanism is walkable and transit-served urbanism integrated with high performance buildings and high performance infrastructure
 - High performance buildings: USGBC LEED and other standards
 - High performance infrastructure (emerging field)
 - Stormwater filtering streets
 - Fifty year paving
 - Catenary street lights (depicted)
 - Trenchless utilities
 - Dark urban skies



Sustainable Urban Environments

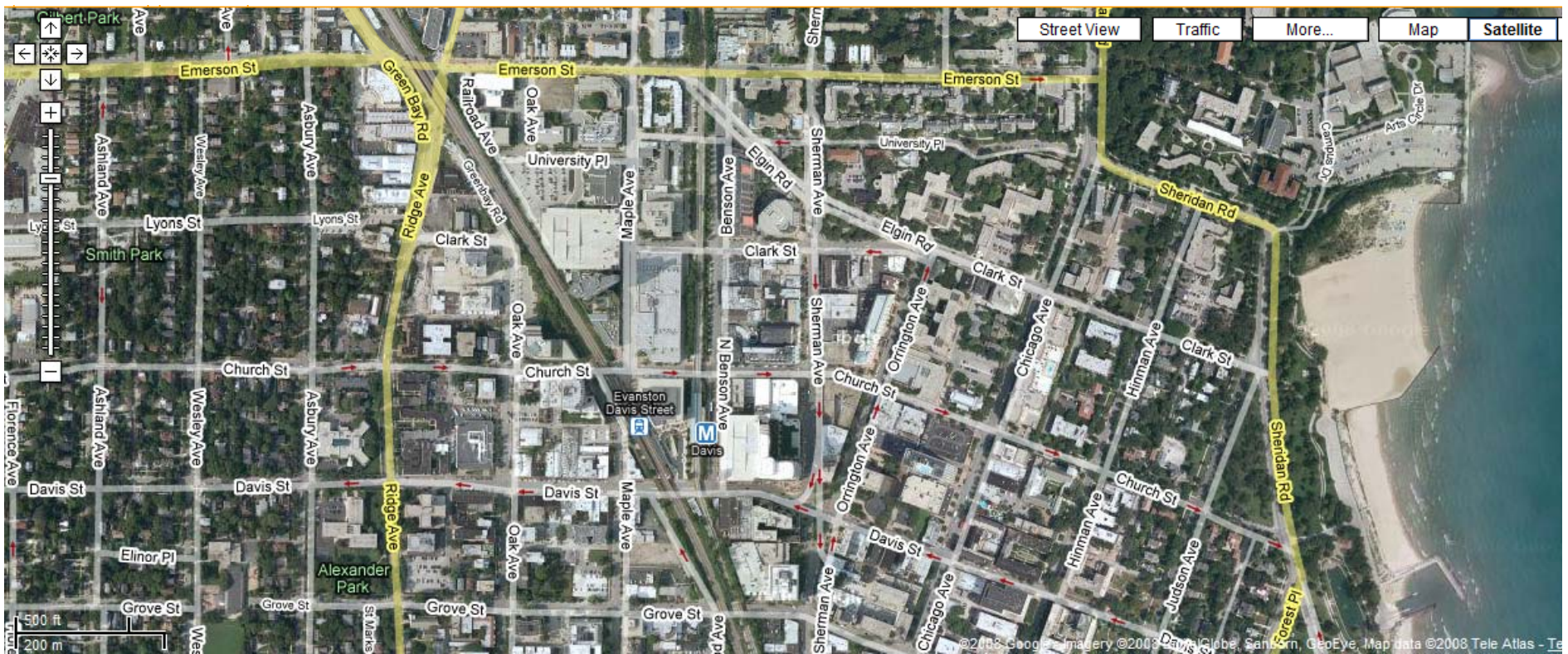


- Compactness (density) and biophilia (human access to nature) are core values of sustainable urbanism
- Sustainable urbanism expands the role of the neighborhood to address its proportionate share of society's social and environmental needs.
 - Eg. Filter all stormwater within the neighborhood and its surrounding open space

Downtown Evanston Illinois

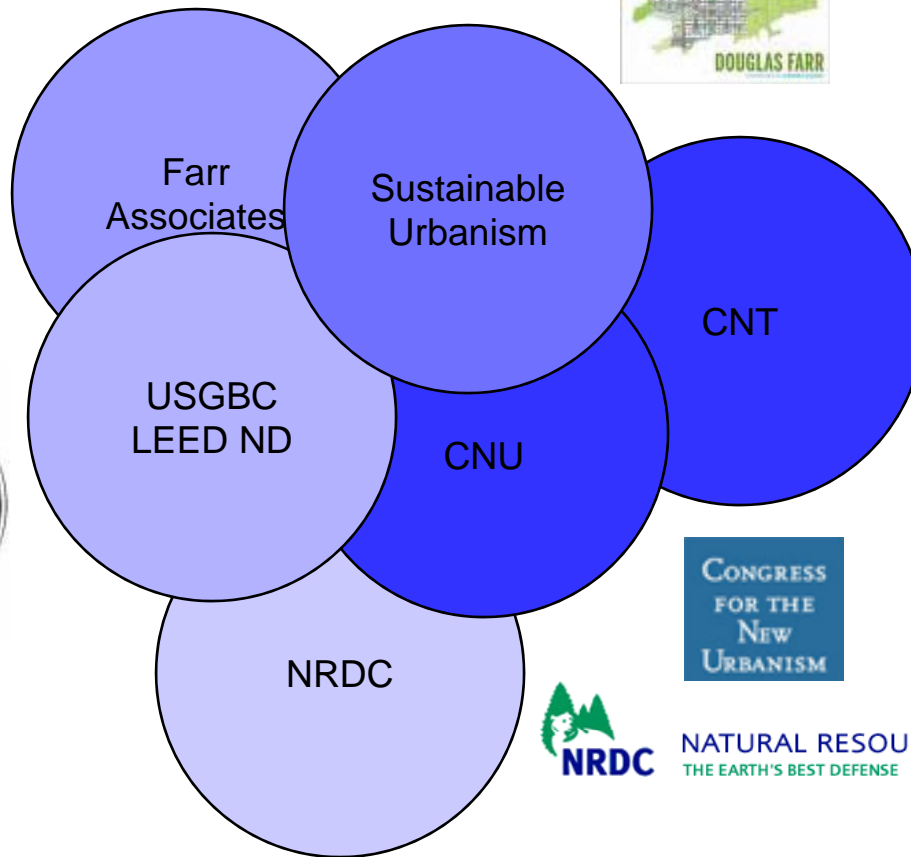
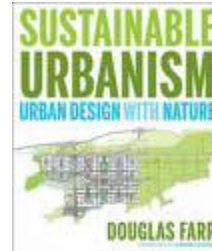
Walkable
Mixed Use – Commercial, Residential, & Retail
Transit Served: Train and Bus

Access to Parks?
Bicycle Friendly?
Community Schools?



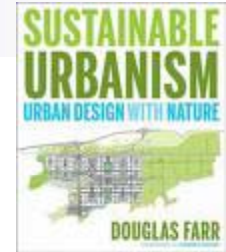
The Sustainable Urbanism Players

- Similar concepts, approaches, and goals are shared among these organizations.



NATURAL RESOURCES DEFENSE COUNCIL
THE EARTH'S BEST DEFENSE

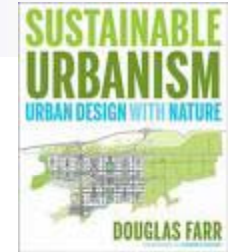




Macro Level Statistics / Trends

- Over the next 45 years, 100 million new Americans – not to mention an additional 2.6 billion people worldwide – will be housed in new infill and greenfield developments.
- Over the next decade two generations of Americans – baby boomers and their progeny called Generation X – will both seek out urban lifestyles, creating an irresistible demographic demand for urban living.
- Generation X – also called the Millennials, the 77 million American's born between roughly 1977 and 1988 – have been raised with recycling and other environmental values. Over the next generation, they will become a powerful societal force – voting and buying real estate.

Macro Level Statistics / Trends

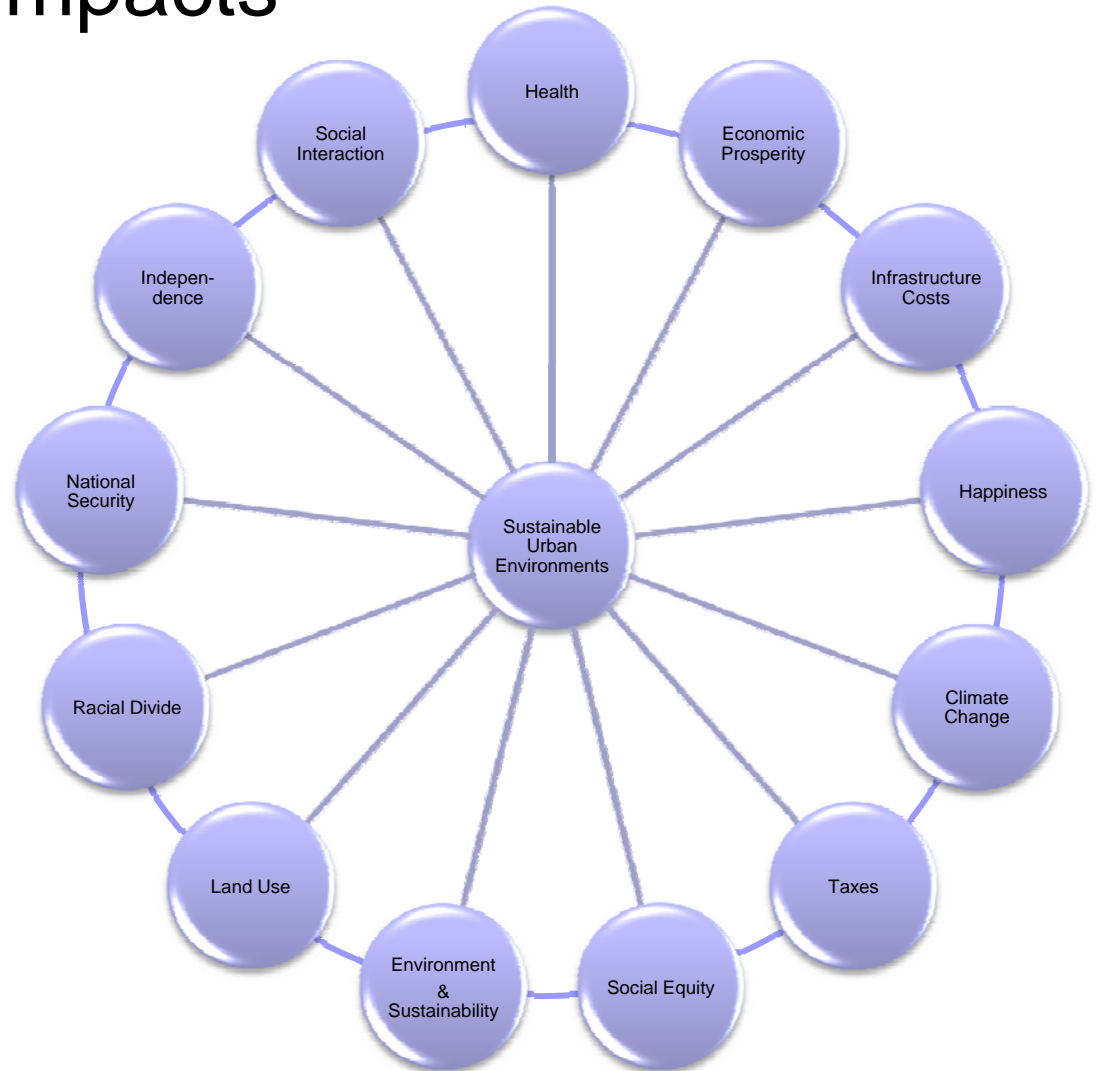


- Currently 6 Million households live within half a mile of existing fixed guideway transit stops
 - Conservative estimates put this number at over 16 million by 2030

- An estimated 200,000 to 300,000 premature deaths occur each year in the US due to physical inactivity

Sustainable Urban Environments: Positive Societal Impacts

- Sustainable Urban Environments take into consideration and have the potential of addressing a range of societies challenges.





Sustainable Urban Env: Interrelationships

- Concepts and approaches are interrelated
- Individual actions can improve multiple challenges
 - Car Sharing
 - Sustainability Eliminates 6 to 15 private vehicles
 - Economic Prosperity No cost to own, park, and insure car
 - Climate Change Shifts fixed cost to variable cost → Minimizes incentive to drive → decreases VMT

 - Independence Maintains mobility
 - Economic Prosperity Minimizes off-street parking → higher density → better transit → business prosperity

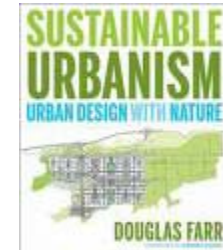
 - Health More open space

Agenda

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- **US Green Building Council (USGBC)**

- LEED for Neighborhood Development Rating System (LEED ND)



US Green Building Council (USGBC)

www.usgbc.org



- Founded in 1993 by:
 - David Gottfried, Mike Italiano, and Richard Fedrizzi (Pres & CEO)

- 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.

- Created the Leadership in Energy and Environmental Design (LEED) Rating System in 2000
 - Standard to certify green office buildings, homes, hospitals, schools, and neighborhoods

US Green Building Council (USGBC)

www.usgbc.org



- As of 2007 the USGBC had
 - 16,345 member companies and organizations
 - 55,391 LEED Accredited Professionals or LEED APs

- As of 2006 ~700 Buildings had been LEED Certified

- Greenbuild International Conference and Expo
 - Chicago – November 2007 ~23,000 attendees
 - Boston – November 2008

- NOTE: Buildings are Certified – Individuals are Accredited

USGBC – LEED Rating System



- Voluntary consensus based rating system
 - Each rating system is open for public comment when appropriate

- Current Rating Systems
 - New Construction (NC)
 - Existing Buildings: Operations & Maintenance (EBOM)
 - Commercial Interiors (CI)
 - Core & Shell (CS)
 - Schools
 - Retail
 - Healthcare
 - Homes
 - Neighborhood Development (ND) (Pilot)

USGBC – LEED Rating System



- Each Rating System (except ND) consists of 6 categories
 - Sustainable Sites
 - Water Efficiency
 - Energy and Atmosphere
 - Materials and Resources
 - Indoor Environmental Quality
 - Innovation & Design Process

USGBC – LEED Rating System



- Each Category consists of Prerequisites and Credits
 - Prerequisites: Mandatory requirements – must be met for all categories
 - Credits:
 - Optional
 - Earn 1 or more points
 - Consist of (example on next slide) – (ND slightly different)
 - Intent: Purpose/goal of credit
 - Requirements: Must be met to earn point(s). May have options
 - Potential Technologies & Strategies: Potential ways of meeting credit requirement



Water Efficiency

WE Credit 1.1: Water Efficient Landscaping: Reduce by 50%

1 Point

Intent

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

Requirements

Reduce potable water consumption for irrigation by 50% from a calculated mid-summer baseline case.

Reductions shall be attributed to any combination of the following items:

- Plant species factor
- Irrigation efficiency
- Use of captured rainwater
- Use of recycled wastewater
- Use of water treated and conveyed by a public agency specifically for non-potable uses

Potential Technologies & Strategies

Perform a soil/climate analysis to determine appropriate plant material and design the landscape with native or adapted plants to reduce or eliminate irrigation requirements. Where irrigation is required, use high-efficiency equipment and/or climate-based controllers.

USGBC – LEED Rating System



- Certification levels (Certified, Silver, Gold, Platinum) obtained by earning points



- Certification point thresholds are different for each Rating System
 - NC: Certified 26-32; Silver 33-38; etc.
 - ND: Certified 40-49; Silver 50-59; etc.
- Reference Guides
 - Provide detailed information for each credit including intent, submittals, requirements, approaches, and examples
 - Includes links to various references and a glossary



Chicago: 45 LEED Certified Buildings



- Chicago Center for Green Technology: Platinum – NC
- Christy Weber Landscaping: Platinum – NC
- CPL Bucktown-Wickerpark: Certified – NC

- Doug Farr & Associates: Silver – CI
- Merchandise Mart: Gold – CI
- Exelon Headquarters: Platinum – CI
- United Airlines Headquarters: Silver – CI
- CTA Headquarters: Gold – EB



Chicago Center for Green Technology



Christy Weber Landscaping



Bucktown – Wickerpark Library

Loyola LEED Registered Building

- Information Commons Building
 - Registered for NC 2.1: LEED Silver



USGBC Documentation Summary

United States Green Building Council (USGBC)

Reference Guide

LEED Rating Systems

Check List

Rating System

Check List

Categories

Prereqs

Credits

Mandatory

Optional

Intent

Require

Tech



Neighborhood Pattern & Design

NPD Credit 7: Walkable Streets
4 to 8 Points

Intent

Provide appealing and comfortable pedestrian street environments in order to promote pedestrian activity. Promote public health through increased physical activity.

Requirements

- Design and build the project such that all of the following are achieved (4 points):
- A principal functional entry of each building has a front facade that faces a public space such as a street, square, park, paseo, or plaza.
 - A minimum of 50% of all street frontages located *within* the project, if any, are planned for development that complies with the minimum building-height-to-street-width proportions of 1:3; and where building sites are planned along streets *bordering* the project, a minimum of 15% of the total street frontage of such sites contains (or is dedicated to) development that will produce a building-height-to-street-width proportion of 1:3. Street frontages are to be measured in linear feet.
 - Continuous sidewalks or equivalent provisions for walking are provided along both sides of all streets within the project. New sidewalks must be at least 4 feet wide. Equivalent provisions for walking include *wooneryfs* and footpaths.
 - All streets along exclusively residential blocks within the project, whether new or existing, are designed for a maximum speed of 20 mph.
 - All streets along non-residential or mixed use blocks within the project, whether new or existing, are designed for a maximum speed of 25 mph.

Smart Location & Linkage			30 Points
Yes	Prereq 1	Smart Location	Required
Yes	Prereq 2	Proximity to Water and Wastewater Infrastructure	Required
Yes	Prereq 3	Imperiled Species and Ecological Communities	Required
Yes	Prereq 4	Wetland and Water Body Conservation	Required
Yes	Prereq 5	Farmland Conservation	Required
Yes	Prereq 6	Floodplain Avoidance	Required
	Credit 1	Brownfield Redevelopment	2
	Credit 2	High Priority Brownfields Redevelopment	1
	Credit 3	Preferred Location	10
	Credit 4	Reduced Automobile Dependence	8
	Credit 5	Bicycle Network	1
	Credit 6	Housing and Jobs Proximity	3
	Credit 7	School Proximity	1

100s of Pages

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3 to 5 Pages



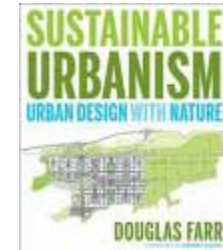
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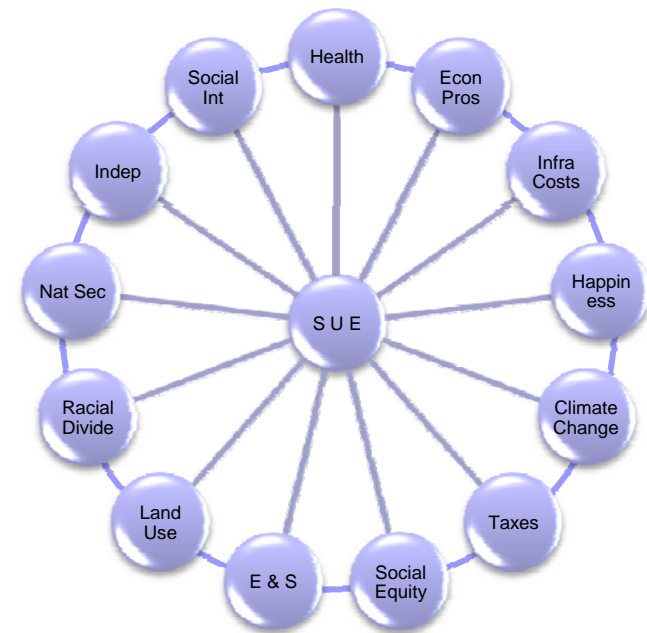
- US Green Building Council (USGBC)

- LEED for Neighborhood Development Rating System (LEED ND)



LEED for Neighborhood Development

- Sustainable Urbanism is walkable and transit-served urbanism integrated with high performance buildings and high performance infrastructure
- LEED ND consists of 4 categories (6 for other rating systems)
 - Smart Location and Linkage
 - Neighborhood Pattern & Design
 - Green Construction & Technology
 - Innovation & Design Process



LEED ND Prerequisites & Credits

Smart Location & Linkage

Prereq 1	Smart Location
Prereq 2	Proximity to Water
Prereq 3	Imperiled Species
Prereq 4	Wetland and Water Body Conservation
Prereq 5	Farmland Conservation
Prereq 6	Floodplain Avoidance
Credit 1	Brownfield Redevelopment
Credit 2	High Priority Brownfields Redevelopment
Credit 3	Preferred Location
Credit 4	Reduced Automobile Dependence
Credit 5	Bicycle Network
Credit 6	Housing and Job Proximity
Credit 7	School Proximity
Credit 8	Steep Slope Protection
Credit 9	Site Design for Habitat or Wetland Conservation
Credit 10	Restoration of Habitat or Wetlands
Credit 11	Conservation Management of Habitat or Wetlands

Neighborhood Pattern & Design

Prereq 1	Open Community
Prereq 2	Compact Development
Credit 1	Compact Development
Credit 2	Diversity of Uses
Credit 3	Diversity of Housing Types
Credit 4	Affordable Rental Housing
Credit 5	Affordable For-Sale Housing
Credit 6	Reduced Parking Footprint
Credit 7	Walkable Streets
Credit 8	Street Network
Credit 9	Transit Facilities
Credit 10	Transportation Demand Management
Credit 11	Access to Surrounding Vicinity
Credit 12	Access to Public Spaces
Credit 13	Access to Active Spaces
Credit 14	Universal Accessibility
Credit 15	Community Outreach and Involvement
Credit 16	Local Food Production

Green Construction & Technology

Prereq 1	Construction Activity Pollution Prevention
Credit 1	LEED Certified Green Buildings
Credit 2	Energy Efficiency in Buildings
Credit 3	Reduced Water Use
Credit 4	Building Reuse and Adaptive Reuse
Credit 5	Reuse of Historic Buildings
Credit 6	Minimize Site Disturbance through Site Design
Credit 7	Minimize Site Disturbance during Construction
Credit 8	Contaminant Reduction in Brownfields Remediation
Credit 9	Stormwater Management
Credit 10	Heat Island Reduction
Credit 11	Solar Orientation
Credit 12	On-Site Energy Generation
Credit 13	On-Site Renewable Energy Source
Credit 14	District Heating and Cooling
Credit 15	Infrastructure Energy Efficiency
Credit 16	Wastewater Management
Credit 17	Recycled Content for Infrastructure
Credit 18	Construction Waste Management
Credit 19	Comprehensive Waste Management
Credit 20	Light Pollution Reduction



SLL Credit 1: Brownfields Redevelopment

2 Points

Intent

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

Requirements

Locate **project** on a site, part or all of which is documented as contaminated (by means of an ASTM E1903-97 Phase II Environmental Site Assessment or a local Voluntary Cleanup Program) OR on a site defined as a **brownfield** by a local, state or federal government agency;

AND

Remediate site contamination such that the controlling public authority approves the protective measures and/or clean-up as effective, safe, and appropriate for the future use of the site.

NPD Credit 3: Diversity of Housing Types

1 to 3 Points

Intent

To enable citizens from a wide range of economic levels and age groups to live within a community.

Requirements


Include a sufficient variety of housing sizes and types in the **project** such that the total variety of housing within the project, or within a ¼ mile of the center of the project, achieves at least 0.5 according to the following calculation, which is based on the Simpson Diversity Index using the housing categories below.

The Simpson Diversity Index score is calculated with the following equation:

$$\text{Score} = 1 - \sum (n/N)^2,$$

where n = the total number of dwellings in a single category, and
 N = the total number of dwellings in all categories.

Score on the Simpson Diversity Index	Points Earned
≥ 0.5 and < 0.6	1
≥ 0.6 and < 0.7	2
≥ 0.7	3



NPD Credit 4: Affordable Rental Housing

1 to 2 Points

Intent

To enable citizens from a wide range of economic levels and age groups to live within a community.

Requirements

Include a proportion of rental units priced for households earning below **area median income** such that:


OPTION 1

At least 15% of total rental units are priced for households up to 50% of area median income and units are maintained at affordable levels for a minimum of fifteen years (1 point);

OR

OPTION 2

At least 30% of total rental units are priced for households up to 80% of area median income and units are maintained at affordable levels for a minimum of fifteen years (1 point);



NPD Credit 5: Affordable For-Sale Housing

1 to 2 Points

Intent

To enable citizens from a wide range of economic levels and age groups to live within a community.

Requirements

Include a proportion of for-sale housing affordable to households at or slightly above the **area median income** such that:

OPTION 1

At least 10% of for-sale housing is priced for households up to 80% of the area median income (1 point);

OR

OPTION 2

At least 20% of for-sale housing is priced for households up to 120% of the area median income (1 point);



NPD Credit 14: 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.

Requirements

For **projects** with residential components:

For each residential unit type developed, design 20% (and not less than one) of each type to comply with the accessible design provisions of the Fair Housing Amendments Act (FHAA) and Section 504 of the Rehabilitation Act (Rehabilitation Act), as applicable. Separate residential unit types include: single-family, duplex, triplex, multi-unit row or townhouses, and mixed-use buildings that include residential units. (Compliance for multi-family buildings of four or more units is already a regulatory requirement.). All paths of travel between residential units and other buildings within the project shall comply with the accessible design provisions of the FHAA and Rehabilitation Act, as applicable;

AND

LEED for Neighborhood Development

- Currently in Pilot Stage

- 238 Pilot Projects

- Largest: 12,800 Acres – The Village at Galisteo Basin Preserve in Santa Fe NM
 - Smallest: 1.0 Acres – Ladd Tower in Portland OR
 - All pilot projects are new development

- Chicago Pilot Project

- 108 N. State Street (aka Block 37)
 - Old US Steel Site – 1,140 Acre Site

- 5 other pilot project in the Illinois





Loyola Environmental Sustainability Class

Topic Areas

- Parks / Open Spaces
- Schools / Sustainability
- Consumption / Consumerism
- Adult Environmental Education
- Alternative Transportation
- Alternative Energy
- Urban Agriculture / Local Food
- Recycling

Applicable Credits: Loyola ES Class

■ Smart Location and Linkage

- Credit 3 – Preferred Location
- Credit 4 – Reduced Automobile Dependence
- Credit 5 – Bicycle Network
- Credit 6 – Housing and Jobs Proximity
- Credit 7 – School Proximity

■ Green Construction and Technology

- Credit 10 – Heat Island Reduction
- Credit 11 – Solar Orientation
- Credit 12 – On-Site Energy Generation
- Credit 13 – On-site Renewable Energy Sources

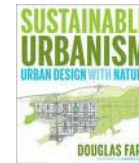
■ Neighborhood Pattern and Design

- Credit 6 – Reduced Parking Footprint
- Credit 7 – Walkable Streets
- Credit 8 – Street Network
- Credit 9 – Transit Facilities
- Credit 10 – Transit Demand Management
- Credit 12 – Access to Public Spaces
- Credit 13 – Access to Active Spaces
- Credit 15 – Community Outreach and Involvement
- Credit 16 – Local Food Production

Resources

- Sustainable Urbanism: Urban Design with Nature

- Author: Douglas Farr



- USGBC – LEED ND Rating System

- <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=148>



- Congress for the New Urbanism

- www.cnu.org



- National Resource Defense Council

- www.nrdc.org



NATURAL RESOURCES DEFENSE COUNCIL
THE EARTH'S BEST DEFENSE

- Center for Neighborhood Technology

- www.cnt.org



- Chicago Center for Green Technology

- Google and click I'm Feeling Lucky





Quiz

- What are the 4 main attributes of a sustainable urban environment?
- Name 3 areas (societal challenges) improved by sustainable urban environments.
- What does USGBC stand for?
- What does LEED stand for?
- What are the levels of LEED certification?
- Which LEED Rating System might you reference for your work on the Edgewater project?
- For which building is Loyola pursuing LEED certification?
- Who is Chicago's Sustainable Urbanism guru?
- Could sustainable urban environments potentially influence taxes?
- Describe how car sharing possibly could improve the economic prosperity of local businesses.
- Approximately how many new Americans will there be in 45 years?
- What does VMT stand for?



Thank You!

