A Resilience Quotient for the West

Rocky Mountain Land Use Institute

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The Panel

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Background

Nationally and Internationally

- Sea level rise
- Coastal / island flooding
- River and stream flooding
- Wildfire risk
- Heat impacts on:
  - Species survival
  - Public health
  - Food production
  - Energy costs
  - Migration

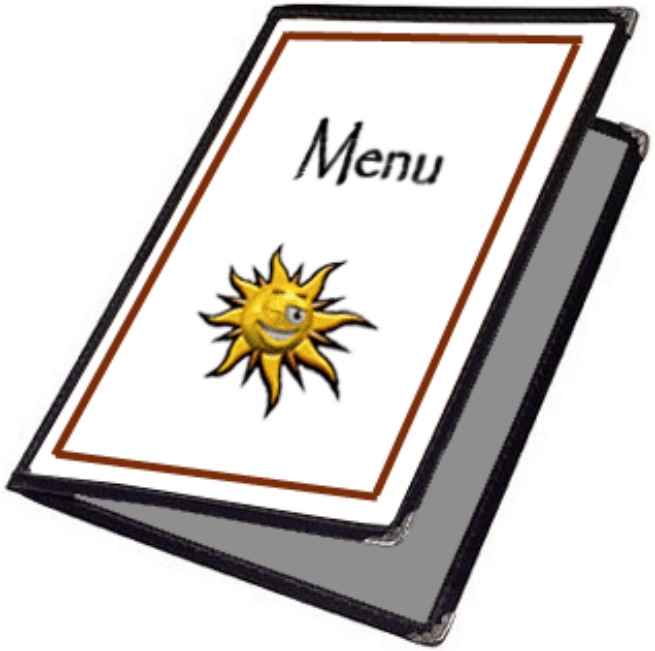
Background

Here in the West

- ~~Sea level rise~~
- ~~Coastal / island flooding~~
- **River and stream flooding**
- **Wildfire risk**
- Heat impacts on:
  - Species survival
  - Public health
  - Food production
  - Energy costs
  - Migration

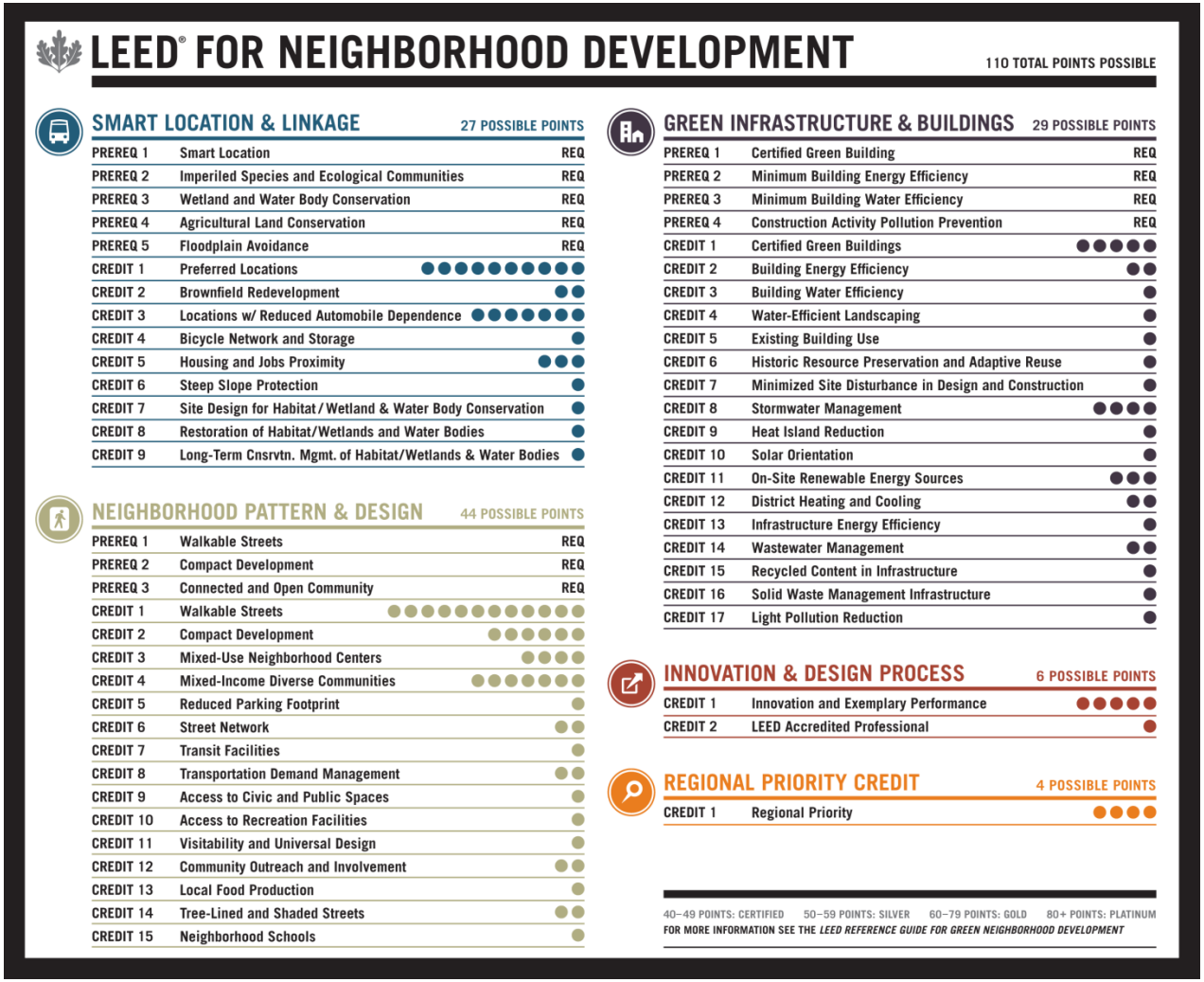
The Topic

Menu-based regulations and incentives as a flexible and effective tool to encourage market-supported choices to address the impacts of climate change



LEED and Other Menus

LEED and LEED-ND



LEED® FOR NEIGHBORHOOD DEVELOPMENT

110 TOTAL POINTS POSSIBLE

SMART LOCATION & LINKAGE — 27 POSSIBLE POINTS

PREREQ 1	Smart Location	REQ
PREREQ 2	Imperiled Species and Ecological Communities	REQ
PREREQ 3	Wetland and Water Body Conservation	REQ
PREREQ 4	Agricultural Land Conservation	REQ
PREREQ 5	Floodplain Avoidance	REQ
CREDIT 1	Preferred Locations	●●●●●●●●●
CREDIT 2	Brownfield Redevelopment	●●
CREDIT 3	Locations w/ Reduced Automobile Dependence	●●●●●●●
CREDIT 4	Bicycle Network and Storage	●
CREDIT 5	Housing and Jobs Proximity	●●●
CREDIT 6	Steep Slope Protection	●
CREDIT 7	Site Design for Habitat / Wetland & Water Body Conservation	●
CREDIT 8	Restoration of Habitat/Wetlands and Water Bodies	●
CREDIT 9	Long-Term Cnsrvtn. Mgmt. of Habitat/Wetlands & Water Bodies	●

NEIGHBORHOOD PATTERN & DESIGN — 44 POSSIBLE POINTS

PREREQ 1	Walkable Streets	REQ
PREREQ 2	Compact Development	REQ
PREREQ 3	Connected and Open Community	REQ
CREDIT 1	Walkable Streets	●●●●●●●●●●●
CREDIT 2	Compact Development	●●●●●●
CREDIT 3	Mixed-Use Neighborhood Centers	●●●●●
CREDIT 4	Mixed-Income Diverse Communities	●●●●●●●
CREDIT 5	Reduced Parking Footprint	●
CREDIT 6	Street Network	●●
CREDIT 7	Transit Facilities	●
CREDIT 8	Transportation Demand Management	●●
CREDIT 9	Access to Civic and Public Spaces	●
CREDIT 10	Access to Recreation Facilities	●
CREDIT 11	Visitability and Universal Design	●
CREDIT 12	Community Outreach and Involvement	●●
CREDIT 13	Local Food Production	●
CREDIT 14	Tree-Lined and Shaded Streets	●●
CREDIT 15	Neighborhood Schools	●

GREEN INFRASTRUCTURE & BUILDINGS — 29 POSSIBLE POINTS

PREREQ 1	Certified Green Building	REQ
PREREQ 2	Minimum Building Energy Efficiency	REQ
PREREQ 3	Minimum Building Water Efficiency	REQ
PREREQ 4	Construction Activity Pollution Prevention	REQ
CREDIT 1	Certified Green Buildings	●●●●●
CREDIT 2	Building Energy Efficiency	●●
CREDIT 3	Building Water Efficiency	●
CREDIT 4	Water-Efficient Landscaping	●
CREDIT 5	Existing Building Use	●
CREDIT 6	Historic Resource Preservation and Adaptive Reuse	●
CREDIT 7	Minimized Site Disturbance in Design and Construction	●
CREDIT 8	Stormwater Management	●●●●
CREDIT 9	Heat Island Reduction	●
CREDIT 10	Solar Orientation	●
CREDIT 11	On-Site Renewable Energy Sources	●●●
CREDIT 12	District Heating and Cooling	●●
CREDIT 13	Infrastructure Energy Efficiency	●
CREDIT 14	Wastewater Management	●●
CREDIT 15	Recycled Content in Infrastructure	●
CREDIT 16	Solid Waste Management Infrastructure	●
CREDIT 17	Light Pollution Reduction	●

INNOVATION & DESIGN PROCESS — 6 POSSIBLE POINTS

CREDIT 1	Innovation and Exemplary Performance	●●●●●
CREDIT 2	LEED Accredited Professional	●

REGIONAL PRIORITY CREDIT — 4 POSSIBLE POINTS

CREDIT 1	Regional Priority	●●●●

40–49 POINTS: CERTIFIED 50–59 POINTS: SILVER 60–79 POINTS: GOLD 80+ POINTS: PLATINUM

FOR MORE INFORMATION SEE THE *LEED REFERENCE GUIDE FOR GREEN NEIGHBORHOOD DEVELOPMENT*

leadinggreen.com

LEED and Other Menus

Bloomington's Sustainability Menu --1.0

Table 4-21: Sustainable Development Incentive Qualification Criteria

LEED v4 Categories	Level 1	Level 2	Level 3
Location and Transportation	5 points	10 points	LEED Certification (gold or platinum)
Sustainable Sites[668]	LEED v4 required credits	LEED v4 required credits, plus 5 points	
Water Efficiency	LEED v4 required credits	LEED v4 required credits, plus 5 points	
Energy and Atmosphere[669]	LEED v4 required credits	LEED v4 required credits, plus 5 points	
Material Resources	LEED v4 required credits	LEED v4 required credits, plus 5 points	
Indoor Environmental Quality		LEED v4 required credits, plus 5 points	
Innovation			
Regional Priority			

NOTES:

LEED and Other Menus

Bloomington's Sustainability Menu -- 2.0

Option 1	Option 2
5 out of these 7 key actions	1 of these
• Site already served by utilities	• LEED Silver Certification
• LID design for stormwater	• NGBS Silver Certification
• Light-colored hardscaping	• GBI Three Green Globes Certification
• Covered parking with reflective surface	• Another third-party certification requiring equal or greater effort
• Cool or vegetated roof	
• Solar panels on much of the site	
• Building efficiency based on LEED metrics	

LEED and Other Menus

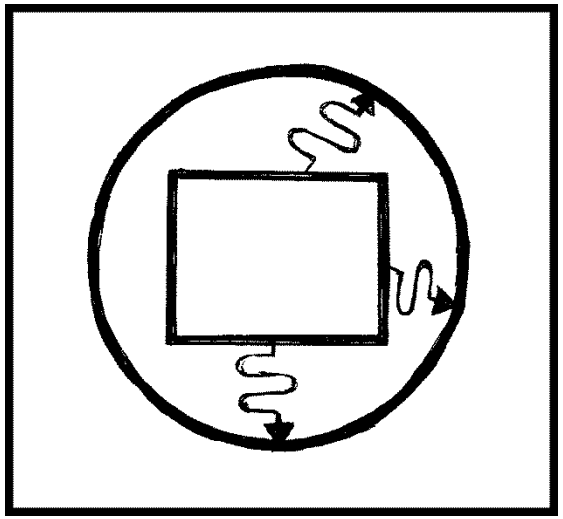
Duluth's MN's Sustainability Menu

Table 50-29-1: Sustainability Point System	
	Points
LOCATION	
Development on previously used or developed land that is contaminated with waste or pollution (brownfield site)	1.50
Development on previously used or developed land that is not contaminated	0.75
Development on a previously undeveloped site that is located immediately adjacent to existing city roadway and utility infrastructure	0.25
ENERGY EFFICIENCY	
Meet ASHRAE standard 189.1 (Section 7.4.2) for building envelope design	1.50
Meet ASHRAE standard 189.1 (Section 7.4.6) for lighting	0.75
Meet ASHRAE standard 189.1 (Section 7.4.3) for HVAC equipment	0.75
Meet Energy Star standards for low rise residential or exceed ASHRAE 90.1-2004 energy efficiency standards by 15%.	1.00

River and Stream Flooding Risk

- The Norfolk framework gives some clues

- **Applicability**
  - Exemptions
  - Single-family homes
  - Multifamily residential
  - Non-residential development
  - Minor deviations



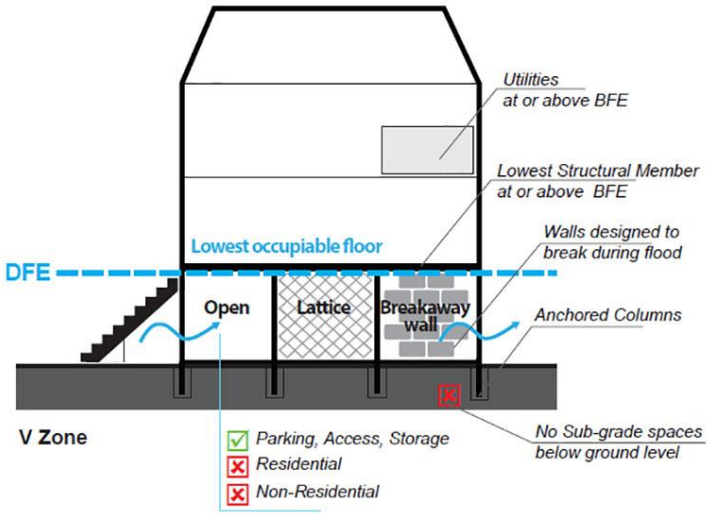
- **Flooding risk reduction elements**
  - Risk Reduction
  - Improved Stormwater Management

River and Stream Flooding Risk

- **Flooding risk reduction elements – often very similar to coastal flooding elements**

Flood Risk Reduction

- Increasing required setbacks from rivers and streams
- Raising structures – or at least critical equipment – 2 or 3 feet above BFE
- Design lower floors as storage / entry / parking with floodwater pass-throughs to reduce structural damage



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River and Stream Flooding Risk

Improved Stormwater Management

- Make LID the standard – and piped systems the exception that requires a public hearing
- Prohibit connections of downspouts to piped stormwater systems
- Allow pre-engineered infiltration solutions for small lots without need for studies or calculations of water volumes
- Rain gardens and bioswales
- A green factor system requiring a minimum amount of permeable surface somewhere on the site or designed into the building

River and Stream Flooding Risk

- **Be careful!**

A green factor system in a menu-based approach becomes "a point system within a point system"

The odds on having unintended consequences are pretty high

Table 744-509-1: Green Factor Calculation

Column 1.	2.	3.	4.	5.
Type of Area	**Number of Plants**	**Area Equivalent in Sq. Ft.**	**Multiplier**	**Score**
Parcel Size				
Vegetation with soil depth < 24 in.				
Lawn, grass pavers, ground covers, or other plants expected to be less than 3 ft. tall at maturity		Measured area	0.2	
Large shrubs		16. sq. ft. per	0.3	
Landscape elements with soil depth of ≥ 24 in.				
Lawn, grass pavers, ground covers, or other plants expected to be less than 3 ft. tall at maturity		Measured area	0.7	
Large shrubs		16. sq. ft. per	0.3	
Small trees		50 sq. ft. per	0.3	
Medium trees		100 sq. ft. per	0.3	
Large trees		200 sq. ft. per	0.4	
Preservation of Significant Trees > 10 in. DBH Or Heritage Tree Species > 8 in. DBH Plus Tree Preservation Credits beyond actual DBH from Sec. 503.L		250 sq. ft. per	0.5	
Permeable paving		Measured area	0.8	
Green roofs				
With < 2 in. but not > 4 in. growing depth		Measured area	0.4	
With ≥ 4 in. growing depth		Measured area	0.6	
Vegetated walls		Measured area	0.7	
Bioretention facilities including but not limited to rain gardens, stormwater planters, and bioretention swales		Measured area	1.0	
Bonuses applied to factors above				
Landscaping that consists entirely of drought-tolerant or native species, as defined by the Administrator			Additional 0.1	
Landscaped areas where at least 50% of annual irrigation needs are met through the use of harvested rainwater or grey water			Additional 0.3	
Landscaping visible to passersby			Additional 0.1	
Landscaping to be maintained in food cultivation			Additional 0.1	
Total Green Factor Score				

Tree species in each size category:
Small trees species = _____
Medium tree species = _____
Large tree species = _____

River and Stream Flooding Risk

- **Take-aways**
  - Create a system in which:
    - Most projects must contribute something
    - More cost earns more points
  - Test the costs and outcomes on a variety of sites before assigning point values
  - Expect applicants to choose the least cost solution
    - That's what they're supposed to do
    - Calibrate it so that outcome is acceptable
  - Don't mandate many specific actions
  - Don't overdo it
    - There is no "right" system

The Panel

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Questions

and

Discussion