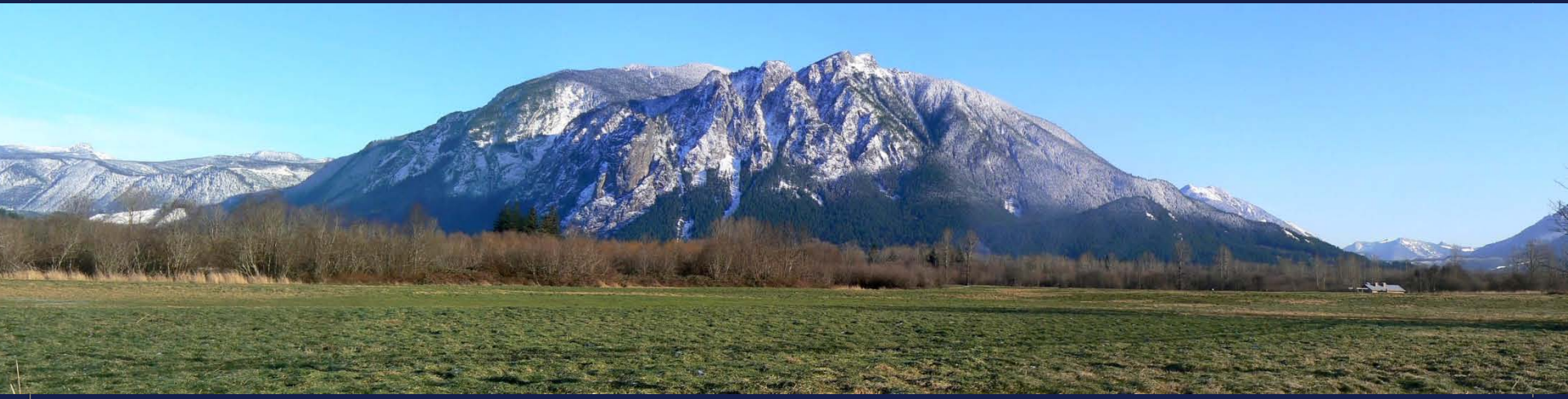


Photo courtesy of Dave Battey

Development of an Energy and Sustainability Element and Sustainability Action Plan

Workshop 2: Green Building and Site-Specific Stormwater Management

Why are we proposing to create an Energy and Sustainability Element?

(Why should North Bend address sustainability)?

The sticks – state requirements.

- **Statewide greenhouse gas emission reduction goals.**
- **Statewide fossil fuel use reduction goals/mandates.**
- **Sustainability requirements for public buildings receiving state funding.**
- **Grant eligibility.**

The ethics – It's the right thing to do.

- **We value the quality of life in North Bend and care about preserving its future.**
- **We have a role to play in addressing local and global environmental issues.**

Preparedness – the early-bird factor.

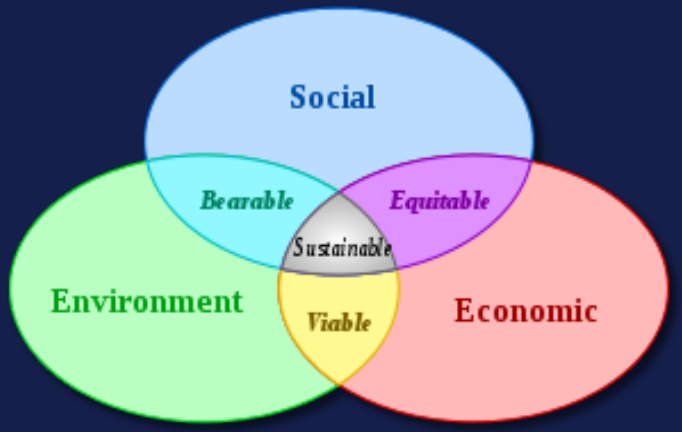
- **Change is inevitable – those prepared come out ahead.**
- **Very real consequences of climate change for North Bend:**

Essential keys to success in North Bend:

- **Simple – easy to understand and implement**

- **Economic – Small city staff and budget constraints**

- **Efficient - Minimize regulatory and time burdens**



WHERE WE ARE IN THIS SERIES:

- April 12: Introduction to series, fossil fuel, water, and electrical energy use and conservation.

- This workshop: Green Building and Site-Specific Low Impact Stormwater Management

- (Future workshops, 1st of each month, will address other measures of sustainability)
  - June 14th – Resource consumption, waste reduction and recycling
  - July 12th – Urban forestry, Greenhouse Gas emissions

- Taking notes – will come back with amendments to draft following workshops.

GREEN BUILDING

GREEN BUILDING

What does it typically include?

- High Energy Efficiency
  - Insulation
  - Low-energy use fixtures / appliances
- Efficient Water Use
- Sustainable Materials
  - Low toxicity
  - Recycled / Recyclable
  - Sustainably sourced content
  - Reduced construction waste
- Sustainable Site Design
  - Walkable neighborhood design, densities and location
  - Infill rather than greenfield sites
  - Low Impact On-site Stormwater Management
  - Natural landscaping, minimized lawn

Green Building – Broad Trends:

Market Factor – Rapidly growing demand

- Significant growth sector, despite downturn in market.
- "The value of green building construction starts was up 50% from 2008 to 2010— from $42 billion to $55 billion-$71 billion— and represents 25% of all new construction activity in 2010." - *Green Outlook 2011: Green Trends Driving Growth* report, McGGraw-Hill Construction.
- Built Green now certifying 30% of all residential market in King County (Sam Anderson, Exec. Director, Master Builders Assoc.)

Green Building – Broad Trends:

Why is the Green Building Movement gaining steam?

- **Reduced environmental impacts**
  - Building heating/cooling represents 20% of Greenhouse Gas Emissions in WA (second largest source after transportation).

- **Healthier for its occupants**
  - Improved indoor air quality
  - Reduced exposure to harmful chemicals

- **Significant long-term cost savings**
  - An upfront investment of 2% in green building design, on average, results in life cycle savings of 20% of the total construction costs—more than 10 times the initial investment. (US Green Building Council, 2012)

  - Ex: Mt. Si HS geothermal heating - $125,000 annual savings. (Valley Record 9/15/10)

Green Buildings - State Requirements

RCW 39.35D – Public Buildings Receiving State Funds

- Recognized long-term cost savings and health benefits of green buildings.
- All Major Facility Projects (new buildings and renovation projects >5,000sq. ft., with exceptions) must achieve at least the LEED Silver standard.
- Applies to:
  - All state agencies and school districts receiving state funding
  - Anyone else with a Major Facility Project that receive funds from the state capital budget.
- Many WA Cities have adopted standards to their own municipal buildings based on same criteria.

GREEN BUILDING PROGRAMS:

- Water Sense Certification
- Energy Star Certification
- LEED – Commercial (now also residential)
- Built Green - Residential
- Salmon Safe Building Certification

GREEN BUILDING PROGRAMS:

Water Sense Certification

- Point-based system focused on water conservation
- Administered by US EPA
- Addresses:
  - Water Sense certified fixtures and appliances
  - Efficient hot water piping
  - Landscape Design
  - Homeowner outreach / operations manual

GREEN BUILDING PROGRAMS:

Salmon Safe Building Certification

- Point-based system focused on stormwater management and stream habitat protection
  - Buffers, habitat restoration
  - Erosion and Sedimentation Control
  - Landscape design

- Administered by Stewardship Partners (Non-profit Organization)

GREEN BUILDING PROGRAMS:

Energy Star Certification

- Point-based system focused on energy efficiency
- Administered by US Department of Energy and US EPA
- Must achieve at least 15% higher energy efficiency than homes built to the 2004 International Residential Code (IRC), through
  - Effective Insulation Systems
  - High–Performance Windows
  - Tight Construction and Ducts
  - Efficient Heating and Cooling Equipment
  - ENERGY STAR Qualified Lighting and Appliances

GREEN BUILDING PROGRAMS:

Built Green - Residential

- Non-profit, residential environmental building program of the Master Builders Association of King and Snohomish Counties
- Comprehensive – addresses building materials, components, and site.
- Point-based program by which builder can achieve 3 - 5 stars depending on level of sustainable measures included in the project.
- Most spec-builders today can easily achieve a Built Green 3 Star
- City incentives typically are not provided for 3 stars, but for 4 or 5 star.

GREEN BUILDING PROGRAMS:

LEED (Leadership in Energy and Environmental Design)

- Point-based system to achieve silver, gold, or platinum levels
- Administered by the US Green Building Council
- Focus principally commercial.
- Now also LEED residential program, and LEED for remodels
- Comprehensive – addresses building materials, components, and site.

Green Building – North Bend Current Practices:

- **FAR Incentives within Commercial Design Standards**
  - Pervious paving - 1 sq. ft. additional floor area for each sq. ft. pervious paving
  - Green roof - 2 sf. ft. additional floor area for each sq. ft. green roof
  - Sun screens - 4 sq. ft. floor area for each sq. ft. of sun screen
  - Rain gardens – 1 sq. ft. floor area for each sq. ft. of rain garden

- **LID – Related Requirements in LID Demonstration Ordinance**
  - Just addresses stormwater, landscaping.

Green Building – Possible Options to Encourage:

- **TIME -** Priority permit processing (Issaquah, Redmond, Kirkland)
- **COST -** Revised permitting and/or impact fee schedule that reduces costs for certified buildings, balanced by increased costs for non-certified (Redmond, Bothell)
- **DEVELOPABILITY -** Density or height bonuses, unit-type flexibility, parking requirement reduction (Sammamish, Redmond)
- **PROMOTION -** City-issued green building awards and publicity (Redmond, Bothell)
- **LEAD BY EXAMPLE** – Like state, require our own public City buildings to meet at least LEED Silver standard or equivalent.
  - (Bellingham, Burien, Bothell, Everett, Kirkland, King County, Kenmore, Lynwood, Mukelteo, Olympia, Puyallup, Redmond, Sammamish, Seattle, Shoreline, Vancouver…..)

Green Buildings – Proposed Policies:

ES Goal 8: Encourage the construction of green buildings in the public and private sectors.

Policies:

ES 8.1 Set an example to the Community and promote green building by requiring public City buildings of a certain size or cost to achieve at least the Leadership in Energy and Environmental Design (LEED) Silver standard, or equivalent.

ES 8.2 Provide incentives to the private sector for the development of green and energy efficient buildings, utilizing programs such as Built Green, Leadership in Energy and Environmental Design (LEED), Energy Star, or equivalent. Incentives can include awards or recognition, expedited review, reduced permitting costs or impact fees, density bonuses, or other measures as appropriate.

ES 8.3 Identify and remove regulatory or procedural barriers to implementing green building practices, such as updating codes, guidelines, and zoning, and ensure that all plan review and building inspection staff are trained in green building materials, practices, and techniques.

LID STORMWATER MANAGEMENT

Stormwater Management - History

- **Pre 1980s – Just Drain It**
  - **Direct to the stream.**
  - **Flash flow - flooding.**
  - **Runoff pollution.**

Stormwater Management - History

- **1980s – 2000's – Detain It**
  - **Addressed flash flow. Slows it down.**
  - **Large ponds, extensive piping**
  - **Later included treatment – multiple ponds**
  - **Expensive and complicated**
  - **Maintenance**

Image from Aarington Engineering

Stormwater Management - LID

- **LID Approach – Infiltrate It**
  - **Mimics natural hydrological systems**
  - **Small-scale, on site features**
  - **Reduced or eliminated area-wide infrastructure**

LID Stormwater Methods

- **1. <u>Minimize</u> Impervious Surface:**
  - **Minimize clearing**
  - **Retain native vegetation/soils**
  - **Pervious surfaces (paving, blocks, mulch)**

Paver Blocks – Image from ESM Civil Engineers

Porous Asphalt - Image from ESM Civil Engineers

Maple Valley Library - Image from Seattle Times

LID Stormwater Methods

- **2. Catch and keep runoff:**
  - **Green Roofs**
  - **Rain barrels for garden use**
  - **Cisterns for non-potable domestic use**

Photo from cbtrust.org

Ballard Library Photo from architecture-view.com

LID Stormwater Methods

- **3. Treat runoff:**
  - **Filter strips – perpendicular to infiltration area**
  - **Conveyance swales – grass lined, shallow, typically along busier roadways**
  - **Bio-filtration swales – grass or vegetation lined, some infiltration capacity**

Image from Virginia Tech College of Natural Resources

LID Stormwater Methods

- **4. Infiltrate runoff:**
  - **Rain Gardens – landscape focus**
  - **Amended soils**
  - **Infiltration Galleries – larger scale, engineered**

Image from Landscape Architecture Foundation

Image from City of Herndon, VA

Stormwater Management – North Bend Current Practices:

- **Principal policies in Critical Areas Element and Stormwater Management Plan**

- **Surface Water Protections for quantity and quality**
  - Stormwater Regulations
  - 2009 King County Surface Water Design Manual

- **Stormwater Capital Facilities Charge and Utility Charge**
  - Based on amount of impervious surface.
  - Incentivizes minimizing impervious surface

- **Clearing and Grading Regulations**
  - Retention requirements for significant trees for new development.

Stormwater Management – North Bend Current Practices (Continued):

- **LID Demonstration Project regulations in NBMC 18.50**
  - Requires 65% of site area be retained as open space
  - Requires 45% of developable site area retain native soils and vegetation
  - Careful structure placement on each lot
- **Low Impact Development / Bioswale Road Standards**
  - Bioswales within ROW rather than stormwater ponds
  - Natural water quality treatment
  - Stormwater infiltration

Stormwater Management – Revisions / Options:

- **NFIP Requirements for Floodplain Development Regulations - require use of LID in floodplains.**

- **Consider Reduced Stormwater Capital Facilities Charge or Stormwater Utility Charge**

- **Additional knowledge following LID Demonstration Plat**

Stormwater Management – Proposed Policies:

ES Goal 13: Maintain infiltration to the City's aquifer and minimize stormwater runoff impacts to surfaces waters through the use of Low Impact Development stormwater management techniques.

Policies:

ES 13.1 Require the use of LID stormwater management techniques within the 100-year floodplain, consistent with floodplain management requirements for participation in the National Flood Insurance Program.

ES 13.2 Incentivize use of additional LID stormwater management techniques that minimize impervious surfaces and capture, treat, and infiltrate stormwater, including vegetated roofs, cisterns, rain gardens, and biofiltration swales.

ES 13.3 Encourage placement of buildings, roads, sidewalks and other development to minimize the need for clearing and maximize preservation of existing native vegetation.

ES 13.4 Ensure the proper care and management of LID stormwater techniques by the City for public facilities, and by private property owners or homeowners associations responsible for these features on private property.

ES 13.5 Develop management protocol to ensure that regular "vacuuming" of pervious paving surfaces is performed to keep them from becoming clogged and losing their infiltration capacity over time.

ES 13.6 Following completion of a residential LID demonstration project consistent with the City's LID Demonstration Project Regulations, evaluate the successes and shortcomings of the development's stormwater management, and consider how the provisions may be applied City-wide.

Additional thoughts and discussion?