The Good, The bad, and The Ugly of LEED Design
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Presentation Objectives

- Articulate a confident baseline strategy in how to approach LEED for your project.
- Learn what sustainable designs have worked and have not worked in some recreation facilities.
- Understand the real cost of LEED and the incremental increase for each LEED level.
Presentation Outline

I. Introduction
   o NIRSA & Sustainability
   o How Big Is It?

II. What is LEED
   o History
   o Process
   o Rating System

III. Examples

IV. Cost

V. Discussion
I. INTRODUCTION
NIRSA’s Six Strategic Values

- Leadership
- Service
- Health & Wellbeing
- Equity, Diversity & Inclusion
- Global Perspectives
- Sustainable Communities
NIRSA’s Commitment to Sustainability

Valuing Sustainability in Collegiate Recreation

Sustainability is meeting the needs of the present without compromising the ability of future generations to meet their own needs.
— The Brundtland Commission, 1987

Introducing LEED

Examples

Cost

Discussion

Commission for Sustainable Communities, Draft April 2012
U.S. Construction Statistics

- **Design Phase**: $1,812,428,245,174
- **Bid Phase**: $26,343,167,616
- **Construction Phase**: $3,747,749,140,139
- **NIRSA member projects**: $3,967,554,422

<table>
<thead>
<tr>
<th>Type</th>
<th>Average Budget</th>
<th>Average Area</th>
<th>Number of Projects</th>
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<td>New Construction</td>
<td>$26,124,513</td>
<td>114,254 SF</td>
<td>96</td>
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<tr>
<td>Expansion</td>
<td>$19,125,412</td>
<td>61,343 SF</td>
<td>61</td>
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<tr>
<td>Renovation</td>
<td>$14,138,380</td>
<td>81,785 SF</td>
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<td><strong>Average</strong></td>
<td><strong>$20,772,536</strong></td>
<td><strong>89,061 SF</strong></td>
<td><strong>219</strong></td>
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</table>

Source: REED Construction Data, Inc.
NIRSA
LEED, Vegas & Gaming

- 2006 USGBC gave a waiver to Vegas to allow smoking in casinos
- Considered casinos and support facilities separate (hotel tower, shopping mall separate for casino)
- Biggest tax breaks by city in the nation - $138M
- USGBC member sponsor
- 5 casinos participate
Me & My Family – CO2 Emissions

National Average - 22 Tons of CO2/Year
Athletic + Recreation Projects

- $2.5 Billion Dollars of Recreation & Athletic Work
- 15 Million+ Square Feet
- 169 Projects
- 84 Renovation/Addition Projects
- NIRSA – 18 Awards
- Athletic Business – 18 Facility of Merit Awards
- Recreation Management – 4 Awards
- AIA – 7 Awards
- 100% Professional Staff is LEED AP
LEED Experience

- William & Mary
- SIUE Engineering
- John Brown Univ

- Centre College Campus Ctr.
- Georgia Southern
- VCU Campus Ctr.
- SIUE Science
- SIUE Science Renovation
- Salvation Army Comm. Center
- Univ. of Dayton
- Morehead State
- Temple Univ.
- Denison Univ.

37 LEED Equivalent Projects
11 LEED Design/Pending

Hastings+Chivetta
ARCHITECTURE • PLANNING • ENGINEERING
LEED Approach

**Immediate Payback**
- Orientation
- Building Massing
- Window Position
- Efficient Site Usage

**Long Term Savings**
- Glazing Area and Performance
- Daylight Controls
- Solar Shading
- Nighttime Ventilation
- Mixed Mode Ventilation
- Reflective Roofs
- Heat Recovery
- Desiccant Cooling
- Evaporative Cooling
- Wind Towers/Scoops
- Green Roofs
- Photovoltaics
- Wind Turbines
- Geothermal
- Double-Skin Facades

No Cost

Low Cost

Medium Cost

Higher Cost

**INTRODUCTION**

**WHAT IS LEED**

**EXAMPLES**

**COST**

**DISCUSSION**
II. What is LEED
About USGBC

- United States Green Building Council
  - Certification, GreenBuild
  - Advocacy, Education, Center for Green Schools
  - Member & Chapter Support

- 84 Corporate Donors
- $75M Revenue $45M Assets
- 77 Chapters
- 181,000 AP Profesionals
- 13,000 Member Organizations
- 900+ Employees
Sustainable Alternatives

- LEED
- Deep Green Initiative
- Kyoto Protocol – 1997 International Reduction in CO2
- ACUPCC – American Colleges & Universities Presidents Climate Commitment – 650 Schools/ 80% CO2 Reduction
- Green Energy Star
- Active Homes
What is Green Design

- Design and construction practices that significantly reduce or eliminate the negative impact of buildings on the environment and occupants in five broad areas:
  - Sustainable Site Planning
  - Safeguarding Water and Water Efficiency
  - Energy Efficiency and Renewable Energy
  - Conservation of Materials and Resources
  - Indoor Environmental Quality
Why was LEED Created

- Facilitate positive results for the environment, occupant health and financial return
- Define “green” by providing a standard for measurement
- Prevent “greenwashing” (false or exaggerated claims)
- Promote whole-building
- Integrated design processes
Benefits of Green Building

- **Environmental Benefits**
  - Reduce the Impacts of Natural Resource Consumption

- **Economic Benefits**
  - Improve the Bottom Line

- **Health and Safety Benefits**
  - Enhance Occupant Comfort and Health

- **Community Benefits**
  - Minimize Strain on Local Infrastructures and Improve Quality of Life
LEED Market transformation

- LEED by Building Type

- INTRODUCTION
  - WHAT IS LEED
  - EXAMPLES
  - COST
  - DISCUSSION

USGBC

All statistics exclude pilot projects
LEED Certification Process

- **A three step process:**
  - **Step 1: Project Registration**
    - LEED Letter Templates, CIR access, and on-line project listing
  - **Step 2: Technical Support**
    - Reference Package
    - Credit Inquiries and Rulings (CIR)
  - **Step 3: Building Certification**
    - Upon documentation submittal and USGBC review
LEED Certification benefits

- Recognition of Quality Buildings and Environmental Stewardship
  - 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, media announcements
LEED Rating System

- Rating System Contains:
  - 8 Prerequisites
  - 5 Innovation & Design
  - 4 Regional Priority Credits
  - 1 LEED Accredited Professional
  - 110 Total Credits

- Certification Thresholds
  - Certified 40-49
  - Silver 50-59
  - Gold 60-79
  - Platinum 80-and up
LEED Rating System

- **Sustainable Sites - 26**
  - credits encourage strategies that minimize the impact on ecosystems and water resources.

- **Water Efficiency - 10**
  - credits promote smarter use of water, inside and out, to reduce potable water consumption.

- **Energy & Atmosphere - 35**
  - credits promote better building energy performance through innovative strategies.

- **Materials & Resources - 14**
  - credits encourage using sustainable building materials and reducing waste.

- **Indoor Environmental - 15**
  - quality credits promote better indoor air quality and access to daylight and views.
The Unfunded Mandate

INTRODUCTION

WHAT IS LEED

EXAMPLES

COST

DISCUSSION
How is Your State Going LEED

- **Top Five States**
  - Colorado (2.74 sq. ft. per capita)
  - Illinois (2.69)
  - Virginia (2.42)
  - Washington (2.18)
  - Maryland (2.07)

- **Bottom Three States**
  - Delaware (0.03)
  - West Virginia (0.14)
  - Mississippi (0.21)

- **National Average 2011** (1.81 sq. ft. per capita)
What's Happened to LEED?

- The intend is good ...the delivery is questionable
- It's a measurement tool not a design tool
- LEED started with three people in a room with an idea that grew into a global standard
- It's a money making political machine
- 'Sustainable development' is an oxymoron
III. Examples
Example – Photo Voltaic Panels

- Solar Energy Source
- Grant/Donor Funded
- South Exposure on Field House Roof
- $250,000 Investment
- 54 KW System
- Payback 25 Years
  - Energy Cost Inflation
  - PV Output Loss
Example – Exterior Sun Shades

- **Annual Energy Cost**
  - $32,000 (with shades)
  - $47,000 (without shades)
  - $150,000 – 10 Year Savings

- **Shade Cost**
  - < $92,000
  - Assuming 5% ROI

- **Other Considerations**
  - Building Scale
  - Shade Outdoor Space
Example – HVAC Filters

- **50,000 SF Building**
- **$250,000 Annual Utility & Maintenance Cost**
- **Quality Filters - $4,000 Premium (Common VE Item)**
- **Benefits**
  - LEED Point
  - Lower Energy & Maintenance
  - Better Air Quality
- **1.6% Savings Required**
- **Like Replacement Is Key**
Example – Occupancy Sensors

- **Benefits**
  - LEED Point
  - Lower Energy Cost
  - Longer Lamp Life

- **Simple Operation Is Key**

- **Most Effective In Medium And Large Spaces**
  - Significant Lamps Per Sensor
  - MP Space (2,000 SF)
  - $175/Sensor
  - 2 Year Payback
Example – LED Light Fixtures

- **Benefits**
  - LEED Point
  - Lower Energy Cost
  - Less Fixture Replacement
  - Dimmable

- **Large Scale Space**
- **Evolving Technology**
- **Life-Cycle Cost Analysis Is Changing**
  - 92% Energy Savings
Example – Skylights

- **Benefits**
  - Daylight
  - Very Effective (3% Area)
  - Lower Lighting Cost

- **Example**
  - 50,000 SF Field House
  - $120,000 Premium
  - $32,000 Annual Lighting Cost

- **Must Turn Off Lights! (Photocells Required)**
- **If Wal-Mart Uses Them …**
Example – Pool Covers

- **Benefits**
  - LEED Point
  - Good Procedure to Install
  - Cover 8 Hours/Day
  - 25% Energy Savings

- **Example**
  - 25yd x 25M Pool
  - $170,000 Cost
  - $38,000 Savings/Year

- **4.5 Year Pay Back**

- **Does Not Include Labor Cost**
Example – Electric Generation

- **Benefits**
  - Feel Good Participation
  - Is Truly Recreational

- **Example**
  - 100 Watts/Hour
  - 24 Hours/Day (10 Hours/Day)
  - 365 Day/Year (250 Days)
  - 6.5 Cents/Kilowatt (5.5 Cents)
  - $1,150/Unit

- **20 Year Payback**
- **Really Never**
Example – Reduced Mechanical

- **Benefits**
  - The Feel of Natural Ventilation
  - User Control
  - Energy Reduction

- **Example**
  - “Big Ass Fans”
  - 10 degree Perceived Reduction in Temperature
  - 5 Degree Actual
  - 4% Energy Savings

- **8-10 Year Payback**
IV. Cost of LEED
Consider Long Term Investment

- Lifetime Building Cost Break Down

- Pre-Construction: 23%
- Construction: 14%
- Energy: 11%
- Alteration: 25%
- Maintenance: 26%
- Financing: 1%

INTRODUCTION

WHAT IS LEED

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Sustainability – Evaluation

- **Seek Life Cycle Cost Savings**
  - 5 – 10 Year Payback Period

- **Consider Proven Systems**

- **Pursue Funding Options**
  - Grant Money
  - Tax Credits
  - Utility Rebate Programs
  - Donor Support

- **Substance vs. Image**
  - True Sustainability
  - Feel Good Gestures
Sustainability – LEED

- LEED Buildings Used 18-39% Less Energy On Average
- 28-35% Of LEED Buildings Used More Energy
- Little Correlation Between Measured Energy Performance And Certification Level

Guy R. Newsham, Sandra Mancini, Benjamin J. Birt
National Research Council Canada – Institute For Research In Construction
LEED Points vs. Measured Savings

INTRODUCTION
WHAT IS LEED
EXAMPLES
COST
DISCUSSION
The Cost of LEED

- **Fees**
  - USGBC Registration Fees
- **Cost of Documentation**
  - Architect, LEED Consultant,
  - In-House Team Member
- **Cost of Extra R&D**
  - Design Team
- **The Cost of Commissioning**
  - Third Party Consultant
- **Cost of Construction**

### Registration Fees

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<tr>
<th>Description</th>
<th>Less than 50,000</th>
<th>50,000-500,000</th>
<th>More than 500,000</th>
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<td>$900</td>
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<td>$5,000 surcharge</td>
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### Standard Review

- Flat rate
- Per Sq Ft
- Flat rate

### Design & Construction Review

- Flat rate
- Per Sq Ft
- Flat rate

### Design Review

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<td>USGBC Silver, Gold and Platinum Members</td>
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### Split Review

- Flat rate
- Per Sq Ft
- Flat rate

### Construction Review

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### Appeals

- Complex credits $800/credit
- All other credits $500/credit

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**INTRODUCTION**  |  **WHAT IS LEED**  |  **EXAMPLES**  |  **COST**  |  **DISCUSSION**
The Cost of LEED

[Graph showing the cost of LEED certification levels (Certified, Silver, Gold, Platinum) for different organizations (GSA, KEMA, Landon Wilson, CC).]

INTRODUCTION
WHAT IS LEED
EXAMPLES
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DISCUSSION
Least Used LEED Point

- 10% of materials such as beams and doors are reused or salvaged 4.7%
- Reuse existing building elements 5.6%
- Use on-site renewable energy 6.6%
- Rapidly renewable materials such as bamboo 7.2%
- 5% of materials such as beams and doors are reused or salvaged 7.3%
Least Used LEED Points

- Reuse 95% of a building exterior 8%
- Use on-site renewable energy 9.9%
- Boost energy performance 42% 9.9%
- Reduce use of potable water in wastewater 12.5%
- Reuse 75% of a building exterior 13.2%
Most Used LEED Points

- Hire LEED accredited professional 99.7%
- Use low-emitting paints and coatings 93.3%
- Boost energy performance 10.5% 92.2%
- Use low-emitting adhesives and sealants 91.5%
- Use recycled materials in construction 90.9%
Most Used LEED Points

- Reduce water use by 20% 90.6%
- Use low-emitting carpet 89.7%
- Divert 50% construction waste from landfill 89.6%
- Boost energy performance 14% 89.0%
- Water-efficient landscaping 86.9%
V. SUMMARY
Summary

- LEED is not Perfect
- Sustainability is Here to Stay
- It’s In our DNA, Laws and Codes
- It’s Not Free But It’s Affordable
- And Don’t Think of Sustainability as Adding to Your Project But Instead Being an Integral Part of It
Discussion
The Good, The bad, and The Ugly of LEED Design