LEEDing the Way
with Practical, Sustainable Design
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Visit the News Section
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 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
U.S. Construction Statistics

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

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<th>Average Area</th>
<th>Number of Projects</th>
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<td><strong>$20,772,536</strong></td>
<td><strong>89,061 SF</strong></td>
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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

INTRODUCTION
WHAT IS LEED
EXAMPLES
COST
DISCUSSION
About Me

- Product of the 1973 Energy Crisis
- Working since 15 for Architects
- Suburban Sustainable
  - Recycle
  - Garden
  - Compost
- LEED AP 2002
Athletic/Recreation/Municipal 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
- Temple Univ.
- Denison Univ.
- Centre College Pearl
- Centre College Science
- Centre College Brockman Commons
- Longwood University
- Morehead State
- Colorado State
- VCU Cary Street
- Berea College

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

**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 Professionals
- 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
Exceeding Our Carrying Capacity

- The Global Impact of Being Un-Sustainable
- Environmental Management
  - Atmosphere, Fresh Water & Oceans, Land Use
- Human Consumption
- Economic
  - Opportunity, Growth
- Social
  - Peace, Poverty, Security
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

- MULTI USE
- COMMERCIAL OFFICE
- HIGHER ED
- K-12 EDUCATION
- PUBLIC SAFETY
- MUSEUMs
- INDUSTRIAL
- MULTI-UNIT
- OTHER
- LIBRARY
- RECREATION

USGBC
LEED Certification Process

- **A three step process:**
  
  o **Step 1: Project Registration**
    - LEED Letter Templates, CIR access, and on-line project listing
  
  o **Step 2: Technical Support**
    - Reference Package
    - Credit Inquiries and Rulings (CIR)
  
  o **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

USGBC
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
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

- INTRODUCTION

- WHAT IS LEED

- EXAMPLES

- COST

- DISCUSSION
Energy Consumption (Central Midwest)

- Fans: 24%
- Lighting: 24%
- Space Heating: 22%
- Pool Heating: 14%
- Cooling: 12%
- Plug Loads: 2%
- Domestic Hot Water: 2%

Sustainability – Energy
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

- Widespread Popularity
- Sustainability = Enhanced Environment
- Smart Sustainability = Measured Value (Save Money)
- Achievable Payback
  - 5 – 10 Year Target
- Substance vs. Image
  - True Sustainability
  - Feel Good Gestures
- Sustainable Appeal
  - Energy Hog vs. Unappealing
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
Sustainability – LEED

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**

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The Cost of LEED

INTRODUCTION

WHAT IS LEED

EXAMPLES

COST

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
LEEDing the Way
with Practical, Sustainable Design