

# 1. Architecture and Urban Design



## **Research Team:**

LEED criteria in theory and in practice

## **Grand Challenge:**

Sustainable Design of Buildings and Urban-Ecological Landscapes

## **Key Terms:**

LEED for neighborhood development, sustainable redevelopment, ecosystems, coastal management, new urbanism, green movement, LEED (Leadership in Energy and Environmental Design) certification, USGBC (United States Green Building Council), new construction, commercial real estate development, developers, project management, economic costs and benefits, green building, profit maximization

**Student Leader:** Hooman Bamdad

## **Student Members:**

- Keri Robinson Preserving our Ecosystems: Applying LEED Criteria in Imperial Beach Redevelopment
- Sean Mayer What effect LEED certification has on construction of new projects
- Scott Roehrick The Economic Costs and Benefits of LEED Certification for Commercial Developers
- Hooman Bamdad The Economic Costs and Benefits of LEED Certification for Commercial Developers are these last two topics supposed to be the same?

## **Mentor(s) Leader:**

- Greg Nelson

## **Team Narrative:**

## LEED Criteria, Theory and Practice

The Leadership in Energy and Environmental Design (LEED) program was developed in 1993 by the United States Green Building Council as an international benchmark for green buildings. The purpose of LEED is “to encourage and accelerate global adoption of sustainable green building design and construction practices through the creation and implementation of universally understood and accepted tools and performance criteria.”citation? There are multiple versions of LEED and different ratings categories based on building and project types. LEED is used for new construction, commercial interiors, retail, schools, health care facilities, neighborhood developments, and existing buildings. Each of these programs includes a unique point system whose categories range from LEED Certified to LEED Platinum depending on the extent to which green materials and principles are incorporated into the project. The USGBC’s LEED program is an accepted method of rating green buildings in over 41 countries around the world.

This research team investigated LEED criteria in theory and practice, incorporating distinct areas of analysis and research methods. By investigating the spatial distribution of LEED projects, the economic costs and benefits of LEED certification, and the application of LEED criteria to entire neighborhoods in a coastal zone, the four researchers in this group demonstrate the depth and scope of sustainable design.

The first paper, authored by Scott Roehrick and Hooman Bamdad, considers the extent to which LEED certification can potentially maximize profits for commercial real estate developers by competing with the cost of conventional construction in conjunction with sustaining increased economic benefits over time. Global environmental concern is at an all time high and increasing rapidly. Buildings are a large contributor to environmental degradation. In fact, they consume 70% of the United States’ electricity and are responsible for 70% of landfill waste and 48% of all carbon emissions. Roehrick and Bamdad argue that it is in society’s best interest to reduce such negative impacts on the natural world. However, LEED certification is voluntary and the decision to pursue this certification typically rests solely on the developer who is often motivated by self-interest and the maximization of profits. Furthermore, conventional developers often lack adequate knowledge to make informed decisions about green building because current research that focuses on its internal costs and benefits is often fragmented, out of date, and/or incomplete. Therefore the perceived opportunity cost of pursuing green building is often seen as too high.

Using a range of sources including case studies, comparative market analyses, interviews, surveys, and scholarly research, Roehrick and Bamdad found that LEED certification can be pursued with relatively low opportunity costs. By incorporating original research based on interviews and case studies, Roehrick and Bamdad were able to expand upon, update, and confirm three important findings. First, LEED certified commercial buildings can be delivered at a price competitive with comparable conventional building. Second, the economic benefits of these green buildings far surpass traditional developments. Green construction premiums can be significantly reduced through strategic project management and offset by financing, government support, and utility incentives. Third, LEED certification has been associated with numerous benefits including: increased marketability, worker productivity and retail sales, reduced operating cost and insurance premiums, superior employee/tenant

retention, and increased rental incomes and property values. Other factors held equal, commercial real estate developers can maximize profits by pursuing LEED certification. Roehrick and Bamdad's findings demonstrate the viability and net gain of green commercial real estate development.

The second paper in the group considers LEED certification from both an economic and spatial perspective. In his research, Sean Mayer argues that the recent trend towards sustainable development has led to an increased interest in the green movement by government agencies and private corporations. Mayer's research considers two primary questions: 1) The reasons why so many LEED accredited sites are projects located in affluent areas; and 2) The reasons why lower-income areas have fewer LEED accredited projects. To answer these questions Mayer considered the fundamental factors that drive the green movement. He contends that the green movement is driven by economic factors similar to many markets in our economy. Similar to any type of economic driven force, the green movement functions based on the wants and needs of the market. Mayer argues that the USGBC used these cornerstones to bolster support for the green movement and eventually created a market demand that gave companies a tool to help distinguish themselves from their competitors. In the current market, developers have realized that the market trend is rapidly heading towards sustainability. Similar to arguments made by Roehrick and Bamdad, Mayer contends that technological advances in green development have allowed for the projects to become more competitively priced. These two findings alone have pushed many developers towards green infrastructure. After an initial trend that saw the development of LEED certified projects in primarily affluent areas, the ripple effect is starting to appear through the acceleration of green developments in less affluent areas. The key influences in the initial stages of the green movement helped to create a market for green projects that attracted developers. After the market had been created, demand took over and companies wishing to distinguish themselves from their competitors pursued green building more frequently. The promise of green development in communities of all income levels suggests that LEED certification might one day be seen as contributing to both sustainable and equitable development.

Using a different lens to examine the LEED certification process, Keri Robinson considers the application of LEED criteria to entire neighborhoods. She argues that in the past, coastal development in San Diego focused on expansion for economic gain and gave little attention to the protection of the surrounding ecosystems. However, many communities in San Diego are now trying to redevelop these areas so that their citizens feel more connected to the community. In the process of doing this, they seek to ensure that the surrounding environments are not destroyed. LEED has a pilot program, LEED for Neighborhood Development, which focuses on how communities can create sustainable environments. In her research Robinson critiques this pilot program by applying it to a specific neighborhood in Imperial Beach. She finds many positive attributes in the program and argues that the application of these methods to San Diego communities will protect coastal ecosystems and create stronger communities. To this end, Robinson investigated the ways in which LEED standards for development can be applied to a specific community and she considers whether or not these standards have a positive impact on the surrounding environment. Robinson used Imperial Beach and its redevelopment program as a case study.

Prior to conducting her research, Robinson hypothesized that promoting LEED regulations in coastal developments would not only encourage sustainable development, but also that it would change public views and influence future development. Applying LEED for Neighborhood Development criteria to Imperial Beach along Palm Avenue and Seacoast Drive, Robinson found that there were deficiencies in the redevelopment program that prevented it from meeting the LEED sustainability criteria. Her research identified specific areas of improvement and further found that the city of Imperial Beach is biased in selecting redevelopment sites. Robinson contends that in order for Imperial Beach to be sustainable, all areas must be redeveloped. Furthermore, by adhering to LEED criteria, the community can redevelop without sacrificing its character and without harming the Tijuana Estuary. In conclusion, Robinson found that although LEED is currently focused on a rating system catered to individual buildings, applying these criteria to complete neighborhoods will improve and encourage sustainable policies on a larger scale. The LEED for Neighborhood Development pilot program holds great promise not just for community redevelopment, but for resident education as well.

The four projects in this research group demonstrate that LEED is clearly coming of age. As it becomes more mainstream, we will see more critical analysis similar to the scholarship presented by this research group. Continued study of the economic and spatial dimensions of LEED should be further pursued to ensure the continued success of sustainable development practices and projects.

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**Links:**

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<http://www.cityofib.com/>

<http://trw.sdsu.edu>

<http://coastalmanagement.noaa.gov/mystate/ca.html>

<http://www.usgbc.org/LEED/Project/CertifiedProjectList.aspx>.

<http://quickfacts.census.gov/qfd/states/>

<http://www.greenbuildingfc.com>

<http://www.usgbc.org>

**Multimedia Archive:**

Available presentations for this group can be found on the Senior Sequence website at:  
[http://seniorsequence.net/?page\\_id=440](http://seniorsequence.net/?page_id=440)