Adventures in GIS to Support LEED Certification

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University of California Office of the President commitment to Campus Sustainability through the “Green Building Policy & Clean Energy Standards”

The UCOP Sustainable Practices Policy concerning LEED

What is LEED?

How was GIS utilized for UCR’s first LEED Certified Structure

How GIS is being used to analyze the Existing Building maintenance of the Campus for LEED

Future of the integration of GIS and LEED
UCOP Sustainable Practices Policy

- Sustainable Practices Policy
  - Established in 2004
  - Established goals in eight areas for sustainable development
  - Includes policies on Green Building for all new buildings, major renovations and maintenance
  - Utilizes the LEED guidelines to enforce Green Building Standards
  - Mandates that all new buildings will achieve a USGBC LEED-NC “Silver” certification at a minimum
What is LEED?

- LEED stands for Leadership in Energy and Environmental Design
- Developed by the US Green Building Council
- Focuses on High Performance Buildings that maximizes Energy Efficiency, Safety and Comfort
- The guidelines provides a standardized framework for defining and implementing Green Building Techniques
- Campus current focus: New Construction, Major Renovations and Existing Building Operations and Maintenance
How GIS is Used for LEED Certification of Campus Facilities?

- Facilities Management System maintains the inventory for all AutoCAD floor plans for the Campus
  - GIS and FMS are integrated systems that use a common Building ID to identify structures on Campus
- Three inch Aerial Imagery was employed for Photo Interpretation and creation of new data layers
- Existing Campus-Wide Base data
  - Including high resolution LiDAR data
GIS was used to obtain the following LEED credits:

- Alternative Transportation
- Site Development – Open Space and Habitat
- Heat Island Effect
Credit SS 4.1 Alternative Transportation, Public Transportation Access

- GIS Data Used
  - ¼ Mile Buffer from Building Entrance
  - Shuttle Routes
  - Accessible Walking Routes
Credit SS 4.2 Alternative Transportation, Bicycle Storage, and Changing Rooms

- GIS Data Used
  - 600 Ft Buffer from Building Entrance
  - Existing and Future Bike Rack Data
  - FMS Data on Shower Facilities
Credit SSc 5.1 Site Development – Protect or Restore Habitat

- GIS Data Used
  - 2011 3 inch Aerial Photo
  - Creation of data set from Aerial Interpretation

- Native and Adaptive Landscaping (17,819 sq ft)
- Existing Woodland (22,629 sq ft)
- SOM Research (19,722 sq ft)
Credit SSc 5.2 Site Development – Maximize of Open Space

- GIS Data Used
  - 2011 3 inch Aerial Photo
  - Creation of data set from Aerial Interpretation
Credit SSc 7.1 Heat Island Effect – Non Roof

- GIS Data Used
  - Interpretation of 2011 3 inch Aerial Photo
  - Tree Canopy Data Generated from LiDAR

50% of Site Hardscape to have a High Solar Reflectivity Index

Surfaces that Reflect Heat will reduce Cooling Loads of the Structure
Existing Building Operations and Maintenance Campus-wide for LEED

- UCR has developed a master site of the Campus for LEED
  - This will streamline future LEED projects on Campus

- Two master site credits for the Campus that utilized GIS
  - SS5c 5 – Protect and Restore Habitat
  - SS5c 6 – Storm Water Quality Control
Credit SSc 5 Campus
Credit – Protect or
Restore Habitat

- Show that the campus is protecting biodiversity

Protected and Restored Areas
(7,536,363 sq ft)
Show that the Campus has limited disruption of natural hydrology
LEED Certification EBOM of Material Sciences and Engineering

- The campus-wide credits were used to bolster the EBOM credits
  - Site Development
  - Storm Water
Off Campus EBOM at Palm Desert Center

- Will conduct a separate EBOM evaluation for satellite campus
  - evaluate the site for Heat Island Effect
Outcomes

- With the addition of GIS as an analysis tool UCR is able to obtain additional credits for LEED Certification.
- GIS brings many varying data types together into one base for analysis including transit, AutoCAD and allows for the creation of new data sets.
- GIS will be utilized on all future LEED Certifications for New Construction.
- GIS will also be used to track LEED Certification of all future Campus projects.
Questions

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