Esri | Manhattan Software, Inc.

Spatial Systems Associates, Inc.



Introducing The Green Team: Developing and Operating High Performance Green Buildings

Going Green. Sustainable Buildings. Minimizing the Carbon Footprint.

What does all the hype related to global warming really mean when it comes to managing a facility? The last three presidents and the US Congress have all been preaching the gospel of environmental sensitivity for years, and now federal facilities face a variety of mandates through compliance with several executive orders and the EISA legislation. These requirements call for a renewed focus on **inventory and management of facilities**, dramatic **reductions in the amount of energy and water used** in the facilities, **reduction in the carbon footprint** of facilities, and **improvement of the indoor environment** of the facilities. All of these requirements and more are also encouraged and defined by the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED®) certification program.

Achievement of LEED certification for a building requires consideration of site sustainability, energy use, water use, recycled materials, and the indoor environment of the built infrastructure. Depending on how well the building meets the guidelines of USGBC, LEED designations of Certified, Silver Certified, Gold Certified or Platinum Certified can be achieved. Starting in 2010, the General Services Administration (GSA) determined that they would not build, operate or lease buildings that were not at least LEED Silver Certified. But what does this mean to the construction or building management industry?

Broadly speaking, sustainability is defined as meeting the needs of the present generation without compromising the ability of future generations to meet their own needs.

Fundamentally, meeting such a requirement would mean that use of non-renewable resources could not be allowed—for

example, fossil fuels (coal, oil, natural gas) could not be used to heat our homes, operate our vehicles or generate electricity to light our way. Plastics, derived from petroleum, could not be used to make the products that we use every day. Our society today produces the majority of its electricity utilizing fossil fuels and we are fundamentally dependent on these fuels for transportation, regardless of whether we drive automobiles or take some form of public transportation. Achieving complete sustainability in today's world is not really practical. Nevertheless, USGBC's approach to certification of buildings encourages striving for a sustainable existence by focusing on:

- Site sustainability
- Energy use reduction
- Water use reduction
- Use of renewable and recycled materials in construction and operations of the facility while ensuring that the indoor environment meet health and safety requirements.

Site Sustainability

Site sustainability includes consideration of a variety of parameters when deciding on what site to choose for construction—proximity to other development, proximity to roads and mass transit opportunities, use of previously developed land, minimizing destruction of natural habitat or restoration of previously disturbed habitat, minimizing use of impervious surfaces, maximizing opportunities to incorporate use of green roofs, collection of stormwater for use both inside and outside the building infrastructure, and minimizing the need to discharge stormwater into surface water conveyances.

Energy Use Reduction

While the goal of complete energy sustainability is evasive, attempts to both reduce the amount of energy being used and, to the maximum extent possible, to use energy produced in a







renewable manner (photovoltaics or wind) are the approaches encouraged by the recent legislation and executive orders. Reductions of energy use of 30% by 2015 are currently required.

Water Use Reduction

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While there has been a significant focus on energy use reduction and minimizing the associated carbon footprint of facilities, a chorus related to what is perhaps a more critical problem of future water availability has been growing. We can live without the excessive use of energy, however none of us can survive for long without access to adequate quantities of potable water. Potable water in the US is derived principally from extraction and subsequent treatment of water resources that are either underground (aquifers) or above ground (surface water) in the form of rivers or lakes. Many developing countries do not yet have anywhere near adequate treatment and distribution of water or collection and treatment of wastewater. Even in so-called developed countries, availability of adequate supplies of potable water beyond the next twenty years is in question. Taking steps to minimize our use of these limited resources now will help to ensure availability of water for future generations. Current executive orders require a reduction in the use of potable water by facilities by 20% between now and 2015.

Use of Renewable and/or Recycled Materials

While not required by the EISA legislation or executive orders, USGBC LEED and other sustainability guidelines strongly encourage the use of materials that are renewable, i.e. wood, in the construction/maintenance of facilities and increased the use of recycled content. For renovation work, reuse of materials that were previously in the building is encouraged, and acquisition of materials made from recycled material is considered in awarding LEED certification points. Further, the use of materials that are manufactured in near proximity to the construction site are also awarded LEED points. On the operations side, use of cleaning supplies that are made from renewable and/or recycled materials or are biodegradable are encouraged, and repairs to existing infrastructure utilizing renewable and/ or recycled materials are awarded. Goals typically include proactive attempts to reduce solid waste as well.

Indoor Environment

It is generally recognized that the most costly component of institutional operations is the cost of labor. Anything that can be done to increase the health or contentedness of the labor force has been shown to pay significant dividends in employee retention and productivity. Building managers will appreciate that a significant number of complaints from building occupants revolve around employee dissatisfaction—real or perceived—with the indoor environment of the workplace. Monitoring this indoor environment and quickly responding to conditions that threaten malcontent or health is an important responsibility of the building management staff. Temperature and humidity controls are common, and the use of building automation system (BAS) technology to manage the control of Heating, Ventilation and Air Conditioning (HVAC) systems is becoming the norm as well. Most buildings in the U.S. are designed to the American Society of Heating,







Refrigeration and Air-Conditioning Engineers (ASHRAE) standards which require a periodic refresh of indoor air utilizing outside "fresh" air to maintain acceptable carbon dioxide levels and to exhaust other common pollutants. Use of this standard requires that refresh air be conditioned (heated or cooled depending on the season and locality) before introduction to the building, and this conditioning requires the use of energy. Since normally over 60% of the energy consumption of a facility is to provide HVAC services, minimizing the need to exhaust previously conditioned air could significantly reduce the overall cost of building operations while prolonging the life of the conditioning equipment. A building manager's ability to analyze temperature, humidity and carbon dioxide levels within a building on an ongoing basis would provide information necessary to assure occupant comfort while minimizing operational costs.

The Role of the Facility Manager

The facility manager is charged with the task of maintaining operations within a building or buildings while assuring the safety of occupants at a minimal cost. This is now required to be done while attempting to operate in a more **sustainable** way. Federal facility managers are mandated to comply with various new environmental and energy legislative regulations and executive orders, and to report to the General Accountability Office (GAO) annually on their success in meeting these sustainability objectives.

The Green Team is prepared to assist the facility manager and his/her staff in achieving both management and sustainability objectives in a facility while providing a convenient web-based information system to maintain data that is used to produce the annual reports required by oversight organizations.

This team has been assembled as "best of breed" suppliers of software and services intended to provide the facility manager with the tools necessary to manage the operations of the facility while collecting and maintaining operational information necessary to produce the reports required to comply with regulatory oversight. The Green Team is comprised of:

Esri—the leading provider of location based information systems (commonly called Geographic Information Systems or GIS) in the world

■ Manhattan Software, Inc.—the leading organization for facility management and corporate real estate technology solutions

Spatial Systems Associates, Inc.—an Esri and Manhattan partner that focuses on development and deployment of customized systems to manage building information, including both Building Information Modeling (BIM) and operations data

This team is prepared to assist you in developing and maintaining the information systems necessary to maximize efficiency in building use and operations while working toward and reporting on achievement of meeting sustainability goals.

Esri GIS for Facilities Management





G IS is becoming more widely used inside buildings as facility managers are applying the insights gained from spatial data to the spaces inside buildings. There is spatial data inside the building, just as there is spatial data at the campus or landscape level, such as roads and parcels. A few examples of spatial data inside a building include floor levels, walls, windows, doors and the spaces that are defined by architectural structures.

Once the core architectural elements of the building have been imported into the GIS database, it is possible for many other layers to be derived from this foundation. Some of the layers that can be derived from basic floor plans include:

- Space use and type definitions
- Lease areas
- Security zones
- Management zones
- Asset locations
- · Evacuation routes and collection areas
- Navigable routes

From the basic GIS data, it is possible to provide location-intelligent decision support to a wide variety of information systems and business processes used by the facility management community:

- Grouping multi-building and multi-site work orders by location to reduce transportation and logistics costs
- Visualizing energy consumption data at the room, building and/or enterprise level in real time and over time
- Analyzing space use, space availability and space optimization across campus or regional or global extents
- Conducting building condition assessments, fire safety inspections and asset inventories using handheld, location-aware (GPS-enabled) devices. These devices provide rapid data capture and the precise location of issues, items and assets, supporting visualization, analysis and reporting.
- Analyzing and visualizing lease performance metrics across the portfolio, regardless of geographic extent
- Analyzing, route mapping and reporting of Americans with Disabilities Act (ADA) compliance and/or ADA facility and fixture availability across the campus or portfolio
- Visualizing the impact of proposed building projects on the campus environment
- Conducting line of sight analysis for security for special events and view shed planning for new buildings
- Modeling the impact of proposed use changes on the supporting utility infrastructure
- Visualizing proposed space planning scenarios



MANHATTAN SOFTWARE, INC. Global Real Estate Software



CenterStone CAFM from Manhattan Software

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IWMS from Manhattan Software



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Manhattan Software, the global leader in enterprise real estate software, provides solutions that address a broad range of real estate and facility management needs. Whether you are a fast growing company in need of a plug-in solution to improve your tactical facility operations, or a large global institution concerned with both tactical field operations and strategic corporate financial management and reporting, Manhattan Software has a solution for you. Manhattan offers its solutions either selfhosted or on a SaaS platform.

Manhattan's CenterStone Computer Aided Facility Management (CAFM) application is designed for facility operations including space management and planning, operations, asset management and lease management. As the market's leading CAFM solution, CenterStone software helps organizations manage the complete cycle of workplace businessprocesses, including space and facilities, assets, leases, workorders and operations. Unlike other CAFM technology products, CenterStone was developed from its inception as an integrated, web-based solution. The CenterStone platform was architected specifically to address the three major shortcomings of traditional tools, specifically ease-of-use, integration, and data access and collaboration.

At IFMA's World Workplace Conference in Atlanta in October, 2010, Manhattan has announced the new release of CenterStone 2011. Notable additions and improvements in this release include enhanced visual reporting and search capabilities, integration with Autodesk Revit Building Information Modeling software (BIM) and integration with Esri® ArcGIS® 10 and ArcGIS® Server software. Also included is a new project-based scenario planning capability.

Ranked the leader in **Integrated Workplace Management Systems** (**IWMS**) in Gartner's Magic Quadrant (July 2008), Manhattan Software offers the only solution in the world that is built on Web 2.0 technology and is designed from inception for the global real estate market. It has multi-language capabilities and includes a best-in-class spatial management system to manage the performance of complex real estate portfolios wherever they are located. In addition, due to the new FASB and IASB accounting changes, Manhattan has the capability not only to predict future financial scenarios, but account in detail for costs of occupancy via its embedded general ledger capability that integrates with ERP systems.

Managers all over the world are using Manhattan IWMS tools to help them make informed business decisions, provide required transparency, reduce the total cost of occupancy, improve sustainability and to release precious capital back to the business. Applications in this rich suite of products include software for planning and managing real estate, facilities, operations, maintenance and projects, as well as execute scenario planning. Finally, Manhattan provides a new way to work with real estate and facility management information with its ability to link to other systems more efficiently, transparently and effectively.

The Green Team Esri

SPATIAL SYSTEMS ASSOCIATES, INC.

GIS & FMIS Implementation & Support Services



SPATIAL MANAGE SAVE



Spatial Systems Associates, Inc. (SSA) is a certified small business Slocated in Columbia, Maryland along the I-95 corridor between Washington, DC and Baltimore, Maryland. Established in 1995, SSA has been providing Geographical Information Systems (GIS) implementation and support services for federal, state, county, municipal and commercial clients in the mid-Atlantic region, utilizing Environmental Systems Research Institute (Esri) technology since its inception.

Within the last several years, SSA has additionally turned its attention inside the building envelope, and is now providing web-based Facility Management Information Systems (FMIS) implementation and support services to many of these same clients. Utilizing the same fundamental Esri tools, SSA has developed an internet-based FMIS approach that not only "maps" building interiors and applies space and furniture/ equipment inventory and management techniques to the buildings, SSA also monitors energy consumption, water consumption, and indoor environmental quality characteristics (temperature, humidity, light, noise, CO₂ levels, etc.) to provide a system that will capture and report information on a real-time basis to the facility manager, while collecting and storing data for analysis or for reporting as part of LEED certification and commissioning. We call this product, **SpatialMMS.** SSA is also a Manhattan partner that assists in the deployment of Manhattan IWMS and CAFM technology for your facility.

Building on the Esri and Manhattan platforms, SSA provides services and support to our clients in the following areas:

Designing & Building Enterprise Solutions

- Consulting & System Design
- Legacy System Integration
- Application Development
- Data Development & Conversion
- Field Data Collection
- Analysis and Cartographic Production
- Training

Tools for Facility Management & Sustainability

- Site Monitoring
- Space Management & Space Utilization Analysis
- Energy Use Monitoring
- Water Use Monitoring
- Indoor Environment Monitoring
- Renewable Energy Integration
- Work Order Management & Reporting
- LEED Certification Services
- Commissioning Services
- Asset Inventory



How can we help you?

The Federal Government is attempting to lead the way in reducing wasteful spending of money and resources resulting from inefficient use and operation of available real property assets. The following Executive Orders and Legislation now require federal compliance:

- Executive Order 13123—Greening the Government Through Efficient Energy Management—June 1999
- Executive Order 13327—Federal Real Property Asset Management—February, 2004
- The Energy Independence and Security Act (EISA) of 2007
- Executive Order 13423—Strengthening Federal Environmental, Energy, and Transportation Management January 2007
- Executive Order 13514—Federal Leadership in Environmental, Energy and Economic Performance—October 2009
- Memorandum to Heads of Executive Departments and Agencies—Disposing of Unneeded Federal Real Estate—Increasing Sales Proceeds, Cutting Operating Costs, and Improving Energy Efficiency—June 2010

These mandates and their included reporting requirements, coupled with USGBC LEED Certification guidelines and federal tax incentives to work toward sustainability, provide a powerful motivation to seriously consider use of technologies that assist in the inventory, monitoring, and management of the operations/maintenance functions related to facilities. The combination of Esri GIS technology, Manhattan IWMS and CAFM software, and Spatial Systems MMS monitoring/reporting tools provide a unified web-based solution to meet the facility information management and reporting requirements of your organization. Used effectively, these tools will:

- Decrease the impact on the environment related to operating and maintaining your facility
- Reduced solid waste disposal
- Reduced carbon emissions
- Decreased use of valuable potable water
- Reduce the operational cost for your facility, thus freeing up funds for use in your broader mission
- Improve the health of occupants of the facilities you are responsible for while minimizing complaints and making those occupants participants in achieving sustainability goals



The Green Team will provide all of the technology and services to establish the information systems necessary to demonstrate compliance with federal requirements, manage facilities more robustly, monitor the operations and use of costly consumables, and report to oversight organizations (internal and external) on your success.

Please contact a member of our team to discuss how to get started on achieving these goals.



The Green Team is prepared to assist you in all aspects of designing new facilities or transforming existing buildings into High Performance Green. Our team can evaluate your current infrastructure for potential to increase efficiencies and reduce operating costs while shepherding your facility through the USGBC LEED evaluation process, providing commissioning services, and achieving LEED certification. We can design a custom monitoring and control system to meet your needs, integrating with your existing control system if one is available. We will install necessary controls/monitors and integrate them into a web-based display system that, at your discretion,

incorporates site characteristics, energy consumption, water consumption, indoor environmental characteristics, space management, furniture and equipment inventory, work order management, and much more into a dashboard that you can access from anywhere with a simple internet connection.

Please contact The Green Team to discuss how we may guickly and inexpensively give you control over the increasing costs of operating a facility while achieving Green Status for your buildings.

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CAFM from Manhattan Software



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