

Keys to Successful Use of a Geographic Information System

By Ed Maghboul

The Massachusetts Port Authority (Massport) became an early user of Geographic Information System (GIS) technology after recognizing that paper drawings pieced together with data from various business systems failed to produce accurate location information for its property managers.

At Boston Logan International, one of Massport's major facilities, the problem was particularly acute. Often the information that the airport's property managers accessed was inaccurate or out of date.

Generating a floor plan to reflect an increase in the size of a tenant's leasehold could take hours to coordinate, for example. Further, when employees made the change to the relevant map file, they had to enter the new measurements manually into the billing system.

Massport set out to remedy this situation and issued an RFP for acquisition of a Common Lease Management System (CLMS) to update its existing lease management method. The specifications for the new system included the ability to interact and interface with Computer

Aided Drafting and Design (CADD) drawings. The selected system was one of the first breed of the new browser-based applications that used a Web browser to deliver

information to desktops. The use of a Web browser-based solution instead of a traditional desktop application provided an unprecedented flexibility to integrate seemingly unrelated

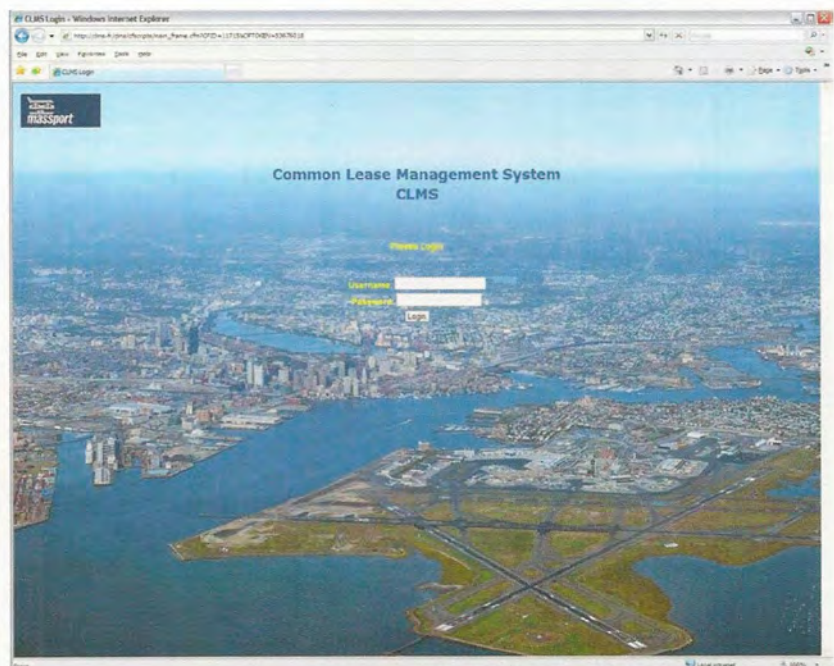


Figure 1. CLMS Login Screen

products into a single user interface. One of the cornerstones of the selected application was the ability to integrate and display floor plan drawings in the form of interactive maps beside tenant and agreement data. In essence, CLMS delivered a GIS-enabled application to users.

Subsequent to the implementation of CLMS, it became apparent that the GIS data available in CLMS would be extremely helpful for other users at Massport. An essential factor for making the GIS data available to a broader user base was the ability to restrict sensitive financial information to the appropriate users. The Massport Geographic Portal (MGP) was developed to fulfill the requirement to provide real-time spatial information to all authorized users while masking financial information.

CLMS has enabled a single employee to maintain lease plans and geospatial data for more than 10 million square feet of space, covering exterior areas and 39 buildings. All of the data is stored within an Oracle database and integrated with information from Massport's business systems. The GIS engine of CLMS drives information sharing by delivering real-time maps that blend geospatial and financial data to authorized users.

When lease managers need to view a lease plan and contract information, they can find the information instantly on Massport's intranet. "Our GIS-enabled application has proved very valuable," explained Greg Zanni, Massport's manager, airport properties and leasing. "I use it every day to review vacancies and spaces that tenants occupy throughout the airport. Compared to our old system, it is a tremendous time-saver because we no longer require assistance from a CAD [Computer-Aided Design] specialist to view electronic lease plans."

The system also ensures the

continuous alignment of spatial and financial information. If an airline acquires new gates or maintenance space, the system automatically adjusts the billing based on the tenant's negotiated price per square foot. "Space planning is a breeze. Just set up a proposed contract; code the rooms you want into it; and

run accurate reports and drawings right out of the system in minutes," said Kevin Gabel, CADD specialist, Massport Airport Business Office.

Moreover, access to information extends beyond lease managers. For example, grounds managers use the system to plan maintenance operations and measure landscaped areas.

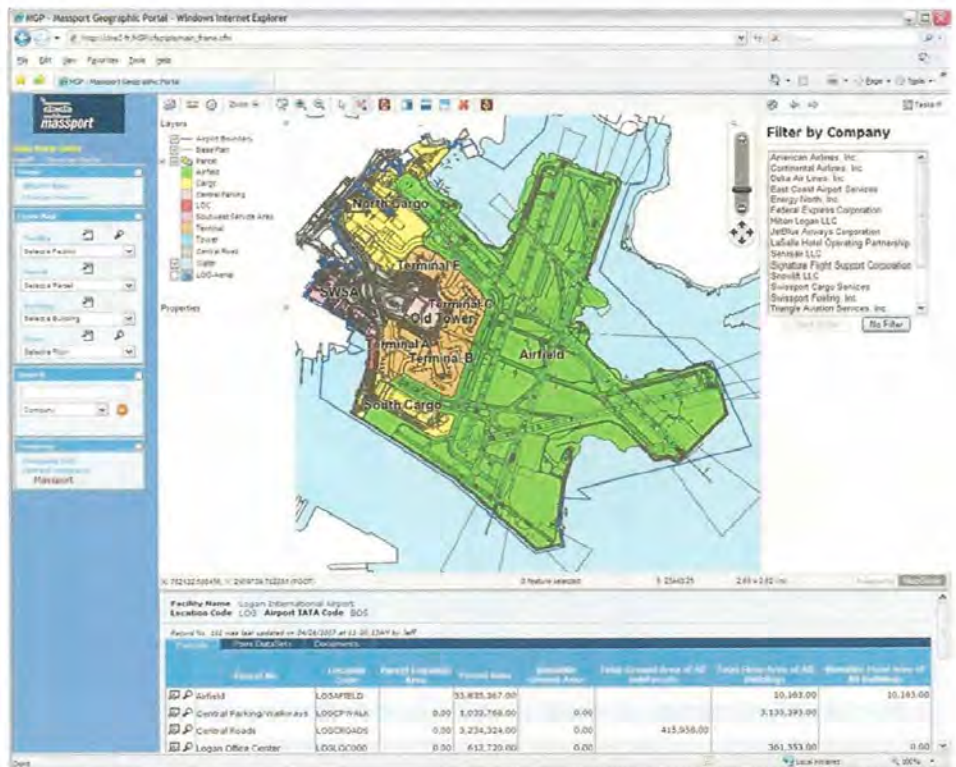


Figure 2. MGP User Interface



Figure 3. Terminal Floor Plan

Massport has witnessed a measurable improvement in the way it manages lease plans and shares spatial data. "Airport terminals are very large and dynamic," said Gabel. "Our system delivers real-time maps and business information, helping us to improve productivity and make better decisions. Our lease managers save hundreds of hours each year, and more than 200 employees access dynamic facility maps each day through MGP."

Throughout the airport industry, GIS increasingly is being viewed as an enabling technology and no longer simply the domain of technical experts and analysts. It has become available to a broader user community. The value of data as a resource is greatly increased by the widespread and appropriate use of this technology.

"Building a strong GIS platform to provide a fast, flexible system that accesses trustworthy information has become a vital aspect of the airport's

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daily function," stated John White, former head of the Geomatics center at Brussels Airport. According to White, GIS systems have become the cornerstone for decisionmaking at airports in the areas of:

- Airport construction, infrastructure management, safety and operations;
- Environmental issues and crisis scenarios, including "what if" options;
- Space management, cable management and asset management;
- Security, including key and




Figure 4. Underground Utilities

- access management; and
- Utilities, including electrical, HVAC, water, sewage, communication, gas, and fire prevention and detection equipment.

important are:

- Adoption of a robust CADD/GIS standard such as FAA's AC 150/5300-18B or the Department of Defense's Spatial Data Standard for Facilities, Infrastructure and Environment (SDSFIE) to ensure the quality of GIS data.
- Seamless flow between CADD and GIS, since more than 80 percent of geometric data in GIS originates as CADD drawings.
- Implementation of a data-centric model to avoid duplicate data, control revisions, eliminate data conversion errors and control data quality.

As the role of GIS in support of all aspects of airport operations increases, a well-planned and executed approach to implementing such a system is the key to success. 

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AAAE's annual GIS conference is scheduled for March 21-24 in San Antonio. Information is available at www.airportGISconference.com.

Data acquisition and maintenance is the single most expensive and vital factor for a successful GIS, and as the usage of geospatial data increases, a generic and centralized approach for data storage is critical. One of newest trends in GIS is the development of a data-centric model instead of an application-centric one, based on an open and non-proprietary database. In other words, this means adopting and implementing a system/data architecture that enables full interoperability among all CADD/GIS software vendors.

Several critical factors must be considered for a successful implementation of GIS. The most