GIS for Effective Space Management: NASA Langley Research Center (UC1127)

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Abstract

Effective space management relies on information about people, places, and processes. Geographic Information Systems (GIS) technology helps facility managers organize and spatially visualize where, and in what type of space, people work. Faced with the daunting task of a Center reorganization which, potentially, could involve the movement of three-quarters of its workforce of 4,000, NASA Langley space utilization planners were in need of tools and techniques to assist them in not only planning a large-scale move, but in management of the facility's available space. In response, the NASA Langley GIS Team is developing a set of tools and applications to support these critical decision making needs. Primary to this effort is the development of a suite of GIS applications that allow space utilization managers to plan and evaluate various personnel move scenarios for buildings and rooms at the center. Lessons learned from this activity will be discussed.

The Problem

Recently, NASA Langley Research Center (LaRC) in Hampton, VA has been faced with decreased federal budget allocations. When coupled with an aging infrastructure and increased maintenance costs, along with the daunting task of a Center-wide reorganization, space utilization managers were faced with a potential relocation of up to three-quarters of the Center's workforce of 4000 workers. Consequently, space utilization planners needed sophisticated tools and techniques to accomplish this complex task.

The Solution

In response to the needs of the Center's space utilization managers, the NASA LaRC GIS Team has developed a set of web-based tools to assist in infrastructure management needs.

The Office Space Utilization Viewer (Figure 1) allows the visualization of organizational distribution and utilization of space. Based on ESRI's ArcIMS technology, using the ArcMap Server and NASA LaRC's locally developed ArcIMS template implementation, this tool allows infrastructure managers to readily assess current organizational space allocations and determine overcrowded and/or under-utilized facilities.
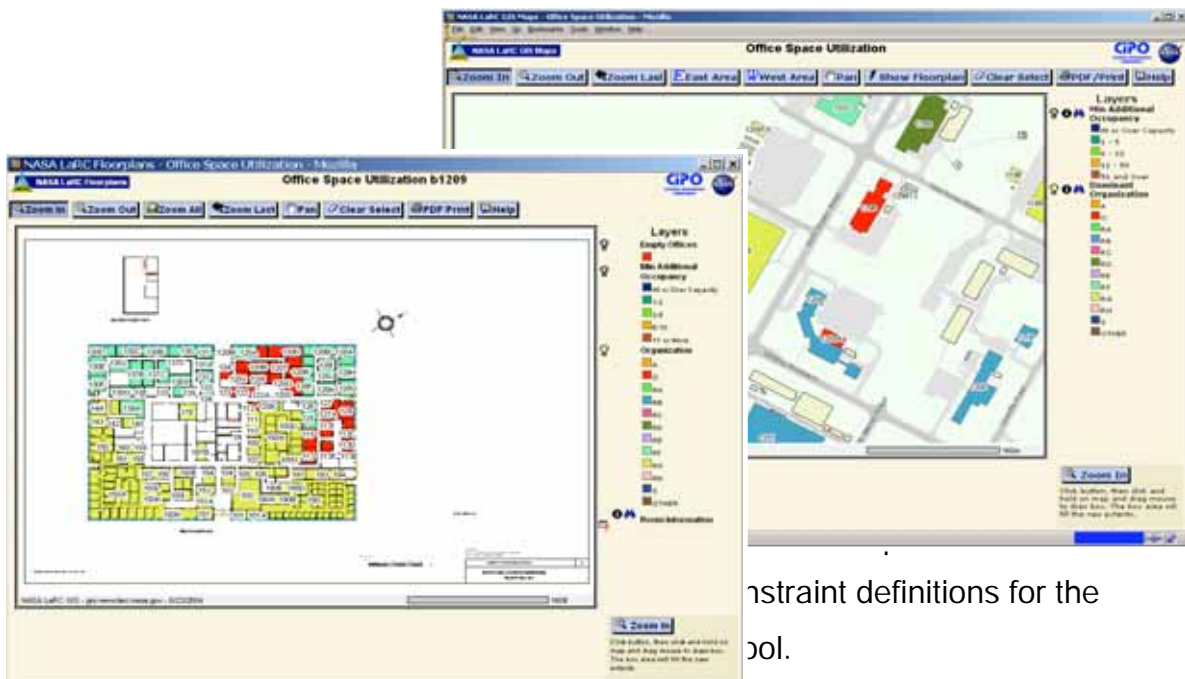

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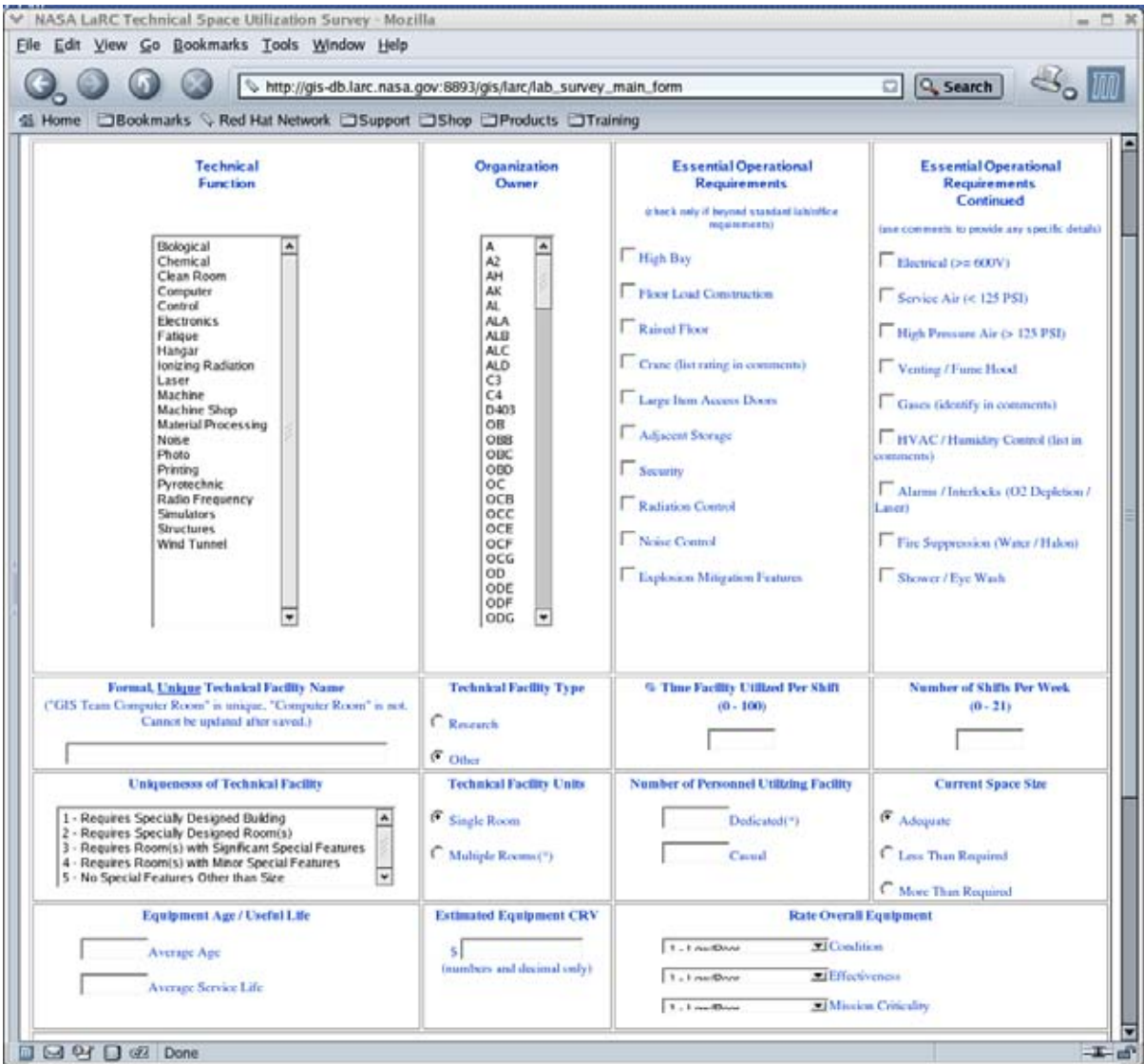
algorithm developed by LaRC optimization personnel. Real-time displays of space utilization parameters such as over/under capacity, available space, etc. are available to the user. Additionally, the tool allows the modification of room classification (office, conference, storage, etc.) and full cost billing information.
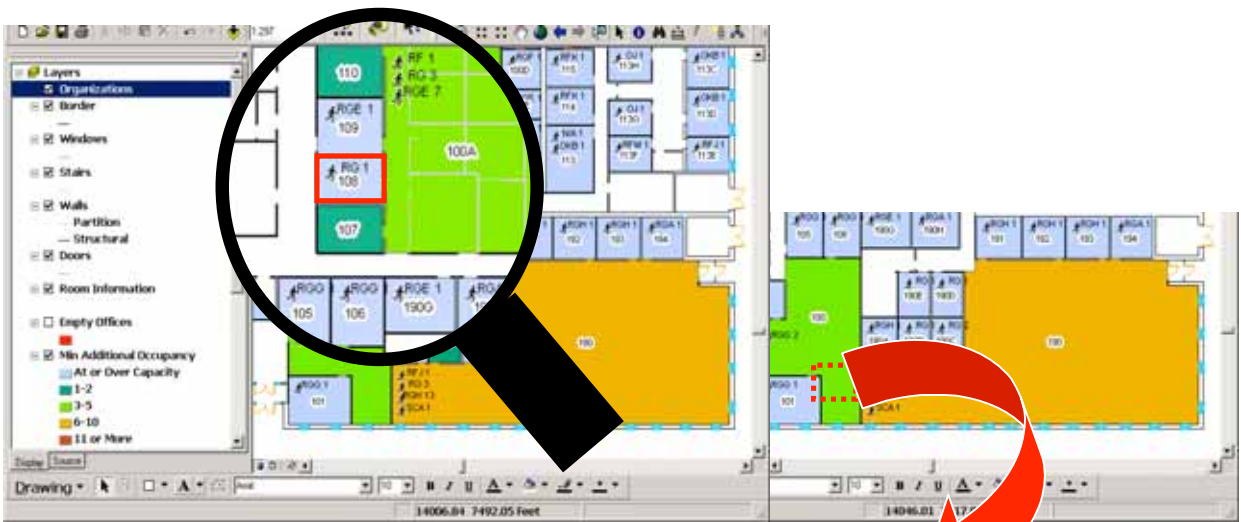
Figure 3. Move Planning Tool

Visualization of the move planning scenarios is accomplished through an ArcMap Server based tool (Figure 4) that allows the space utilization planner to review optimization algorithm results, assess the results of the move planning scenarios, and consequently, discover new constraint definitions that will flow back into the optimization and interactive move planning process.
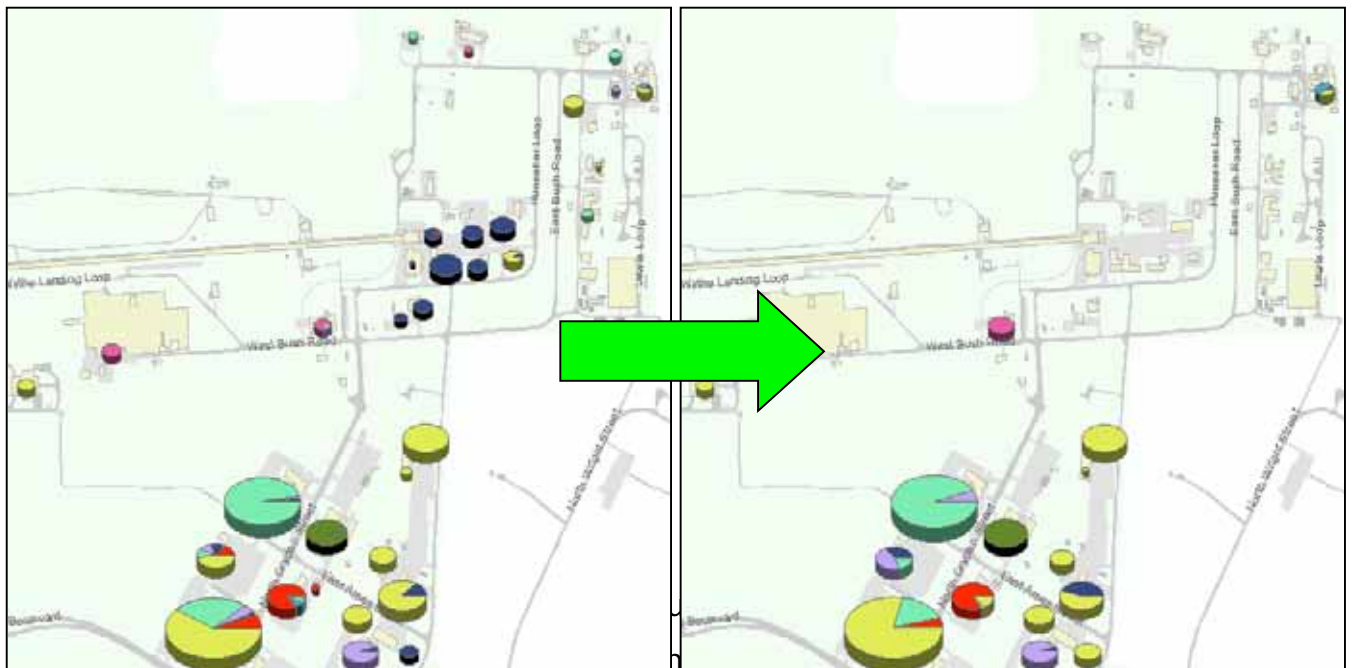
was developed to accomplish that task. The Personnel Assignment Tool (Figure 5) allows the efficient assignment of personnel to space based on organizational slots. The tool allows the delegation of detailed planning to the appropriate management level. Using this tool, the space utilization manager generates a request to the organizational manager to assign her/his personnel to the defined slots. Subsequently, the proposals are submitted for acceptance. The organizational and space utilization managers may evaluate submitted proposals through either tabular lists or graphical display.

Organization Coordinator Personnel Room Assignment Form
Move Scenario: ocio6_21_04_a
Organization Code: AL

View Summary Report   Save Assignments   **Notify Utilization Manager
Room Assignments Completed**

Building #	Room #	Room Seat #	Employee
1219	216A	1	LODDING, DEBORAH S. (1219 / 216A)
1219	220	1	ROE, RALPH R., JR (1219 / 220)
1219	221	1	GRAHAM, BRENDA H., (1219 / 221)
1219	222	1	Vacant Seat
1219	223	1	STRICKLAND, SANDRA L. (1219 / 223)
1219	223	2	MUNAFO, PAUL (1219 / 223)
1219	224	1	CHAMBERS, MARK A. (1219 / 224)

View Summary Report   Save Assignments   **Notify Utilization Manager
Room Assignments Completed**

reduce infrastructure costs.

As of June 2005, the NASA LaRC GIS Team has been presented with a similar challenge to develop tools and techniques for the planned reduction and consolidation of laboratory and technical facilities in an attempt to reduce infrastructure costs to cope with planned budget reductions. Many of the techniques developed for the office space reduction effort are being applied to solve an even more complex problem.

Acknowledgements

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