

# GIS in Tough Economic Times

## *A technology for revitalization*

*An 8.5 percent national unemployment rate (March 2009)*

*A 6.2 percent decline of the gross domestic product in the fourth quarter of 2008*

*The failure of thousands of businesses including household names like Circuit City and Lehman Brothers*

These numbers make the extent of the current downturn clear. There is an immediate need to deal with effects of job losses and high foreclosure rates on local communities. Revitalizing the United States economy will be a formidable task that will require innovative approaches to challenges such as modernizing energy generation and rebuilding the nation's infrastructure.

Unlike previous recessions, government and business have a powerful technology for dealing with diagnosing and treating the ailing economy on the local, state, and national levels. GIS has evolved beyond the organization level to become a framework for managing and analyzing data, modeling scenarios, supporting decision making, and disseminating information.

that have taken them back and are targets for vandals.

Local governments in two California cities, Chula Vista and Riverside, have GIS applications that address the problems of poor house maintenance and graffiti and minimize the negative impact of vacant houses on neighborhood values. Articles in this issue explain why GIS has been invaluable in enforcing the home maintenance ordinance in Chula Vista and identifying and prosecuting taggers in Riverside.

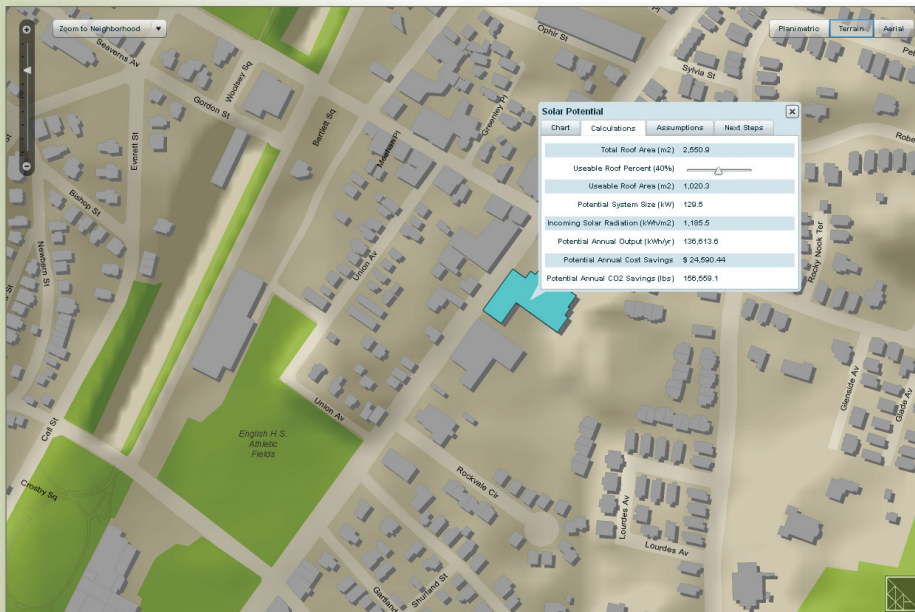
### **New Strategies and Sources**

Even before the current economic troubles, the effects of the run-up in oil prices in mid-2008 made clear the urgency of managing and using existing energy more efficiently and incorporating new sources of energy, particularly renewable energy.

GIS is contributing significantly to the development of commercially viable renewable energy. Utilization of the two most common renewable energy sources, solar and wind, is more challenging than conventional energy sources. Both energy sources are available intermittently and are typically more geographically dispersed than oil or natural gas. GIS helps evaluate the potential of sites for energy generation and the feasibility of getting energy to users.

The Boston Redevelopment Authority created Solar Boston, an online mapping application developed using the ArcGIS API for Flex, that allows users to see active renewable energy installations within the city and calculate the solar potential of building rooftops. In addition to calculating usable roof area and incoming solar radiation, this application generates figures for annual energy output in kilowatts per year, anticipated annual cost savings, and CO<sub>2</sub> savings.

The site for the wind farm project and the location of individual wind turbines within Iberdrola Renewables' Rugby Wind Project were determined using GIS to assess wind availability, take into account the existing electrical transmission infrastructure, and consider many environmental factors in the surrounding area. The project, currently under construction near Rugby, North Dakota, could produce enough power for 11,000 homes.



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### **Local Effects**

A cascading series of events in the last two years—declines in the housing market, financial institutions in crisis, contracting credit, and business failures—has led to widespread job loss and house foreclosures.

Communities that have experienced high rates of home foreclosure, in addition to the impacts on revenue, have the very practical problem of dealing with neighborhoods with many vacant houses. These houses often are not maintained by the financial institutions

# technology for revitalization

## The Grid Can't Be Smart without GIS

The role of GIS in transforming utilities that use conventional energy sources is substantial. Utilities already use GIS to comprehensively inventory electrical distribution network components. In the future, existing GIS implementations will be the foundation for Smart Grid.

Rather than a specific system, Smart Grid is an approach for intelligently managing the generation and delivery of energy. Not only does it help utilities handle loads more efficiently, it also enables interaction between the providers and consumers of electricity and significantly automates the process of restoring the network after an outage.

Today, most electricity utility systems are passive and unaware of problems in the field. Other than information about main supply substations, these systems have little information on their status.

Spatial technologies offer the breakthrough needed for utilities to operate much more effectively and interactively. Utilities will use GIS as a method for organizing data collected from sensors and smart meters and communicating status information to the utility and its customers.

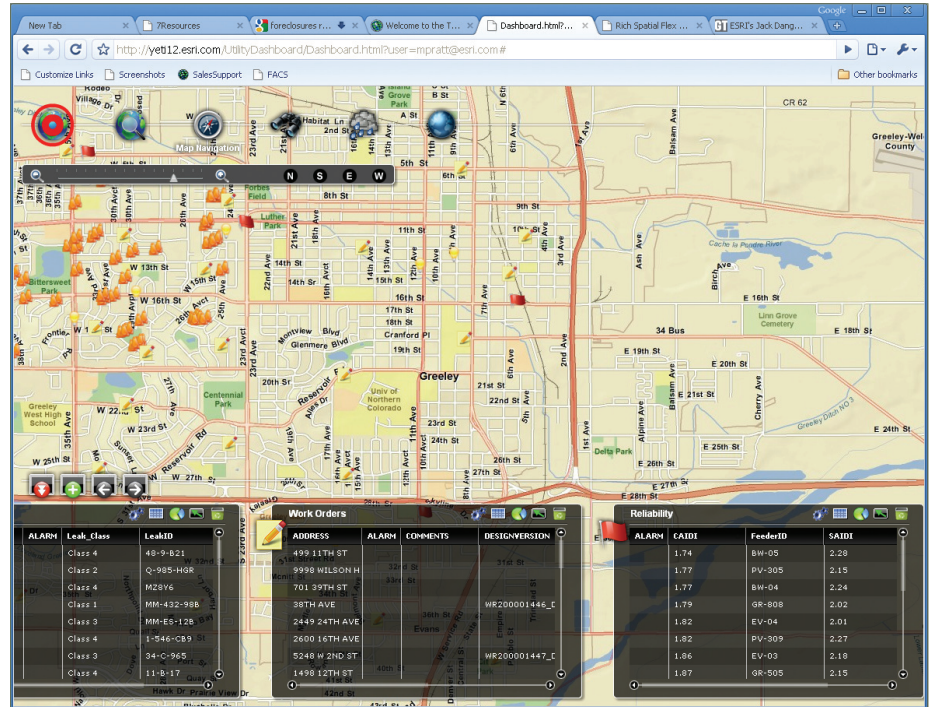
CenterPoint Energy, a Texas company that supplies electricity and gas to approximately three million customers, has a sophisticated enterprise GIS that meets both its engineering and business needs. In 2007, the company deployed Smart Grid technology on a limited basis in Houston, initially installing 10,000 smart electric meters and 500 smart natural gas meters. Following this successful project, the company received approval from the Public Utility Commission of Texas (PUC) to deploy 2.4 million smart electric meters over five years, beginning in 2009.

According to CenterPoint Energy's GIS manager, Cindi Salas, "GIS technology plays a key role in the automation strategy in that it will provide the initial infrastructure data that will fuel the automated analytics."

## Spatializing Stimulus Spending

The development of the Smart Grid is just one example of how GIS technology is helping rebuild and expand the nation's infrastructure.

The American Recovery and Reinvestment Act of 2009 (ARRA) dedicated billions of



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dollars to jump-starting the economy. These funds will be allocated to thousands of projects that will rebuild the nation's physical and technological infrastructure. GIS provides tools for evaluating and prioritizing these projects so ARRA funds are spent in the most beneficial manner.

An article in this issue, "Geographic Insight—A more rational approach to managing stimulus spending," describes how GIS has been used on the local, regional, and state levels for identifying and targeting problems, prioritizing projects and programs, measuring the performance, and ensuring government accountability.

In addition to highlighting existing applications used by the City of Baltimore and the State of Maryland, this article illustrates how GIS can foster government accountability on the national level. ESRI has developed a prototype application called FedStat that can be used for prioritizing and tracking the billions of dollars allocated to the ARRA.

Just as the value of GIS is greatly amplified when it moves from the project or department

level to an enterprise-wide implementation, FedStat offers data management, analysis, and visualization capabilities that will assist government in spending stimulus funds in a manner that will truly revitalize the United States economy while promoting government transparency and accountability.

## Come for the Savings, Stay for the Quality

In good economic times, government agencies and businesses were attracted to GIS because of its promise to save time and money. In an economic downturn, the ability to do more for less has become imperative for organizations.

Historically, GIS has done just that by increasing productivity, automating processes, and increasing efficiency. However, the insights provided by viewing data in a spatial context have fostered better resources management and increased collaboration and communication. With the development of Web GIS in recent years, the tools of GIS available to policy makers at all levels of government can enable more informed decision making and performance measurement.