

# Infrastructure Stimulus: Green Economy and Green Jobs

## EARTH SCOPE

 *A new era is upon us, with palpable tension for 2009.*

Citizens in Washington and around the country appear to have focused, finally, on seriously working our way out of the mess we have gotten into. And what a mess it is. Al Gore's message on global warming is now being accepted as reality by most citizens at a time of competing crises and economic implosions that simply boggle the mind. Our saving grace appears to be that intelligent leadership, under the Obama administration, is ready to take charge and tackle the litany of challenges and issues facing our nation and the world.

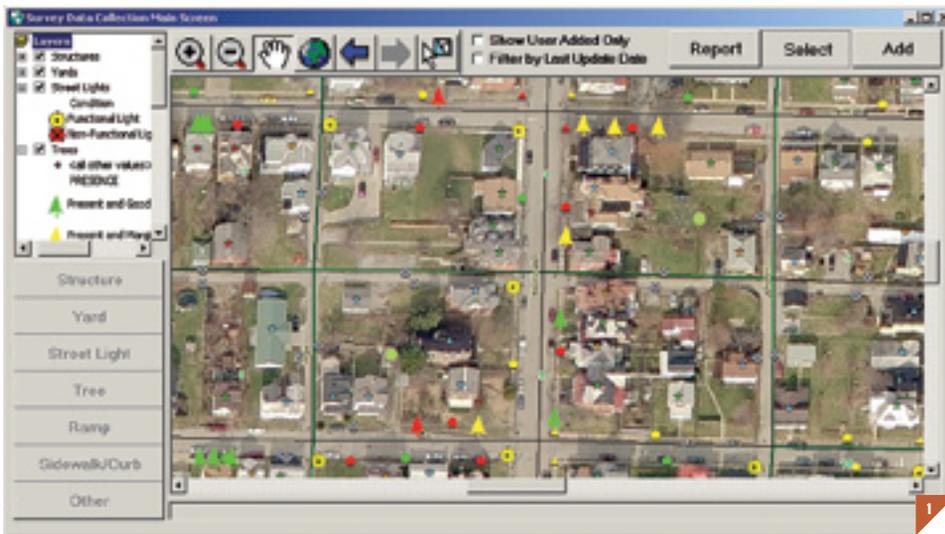
Rome was not built in a day, but it was built by engineers. And we can expect to see a lot of green and sustainable engineering projects at state and local levels working

creating a blueprint for green-engineering our way out of city decay and social pathos. Positive thinking for the New Year: The good news is that the remote sensing and GIS communities recognize the credible and crucial roles they must play in this new era of green hope.

Green engineering encompasses a wide range of civil engineering and public works operations. Improved building codes for new construction seen in U.S. Green Building Council ([www.usgbc.org](http://www.usgbc.org)) and LEED (Leadership in Energy and Environmental Design) standards are often viewed as the poster children for green buildings. However, significant work is required immediately to retrofit existing homes and other buildings for energy conservation to save money and reduce energy loads from fossil-fuel-driven electric grids (*Figures 1 and 2*).

Over two decades, research and operational experience have proven that remote sensing with infrared scanners is a cost-effective approach to assessing thermal losses in residential and industrial facilities. Integrating thermal loss imagery with GIS parcel and district databases can be used to investigate energy audits and to assess options for engaging industry and homeowners with conservation and retrofitting campaigns. Retrofitting campaigns will require large labor pools of caulking and insulation workers, as well as people trained in solar panel installation.

Currently, energy audits are being conducted throughout the state of Maryland and the City of Baltimore using utility billing information combined with computational models and selected onsite instrumentation. Spatial data information systems and aerial measurements can



**▲ FIGURE 1**  
*Satellite imagery-based spatial information system used for inventory and field survey assessments for Waynesburg, Pennsylvania (courtesy of JMT).*

to rebuild America while providing new impetus for the creation of green-collar jobs. Aligning and funding The Green Jobs Act (passed in 2007) with the Infrastructure Stimulus Package, and perhaps

tying mortgage refinancing schemes with energy conservation retrofits, would help to educate, empower, and engage a whole generation of young citizens, leading them into productive green collar careers.

If you haven't already, I suggest you read Van Jones' book, *The Green Collar Economy*, along with a series of reports by the Center for American Progress ([www.americanprogress.org](http://www.americanprogress.org)), to delve more deeply into the economics involved in

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**◀ FIGURE 2**  
*VAIO field data collection recorders for house-to-house survey and inventory (courtesy of JMT).*

provide a more meaningful and quantitative approach to energy audit initiatives.

Transportation is another green engineering domain that has a document history of applied remote sensing and GIS technology. The challenge is to accelerate the use of spatial data and information systems to help design and re-define environmentally sound and sustainable transportation systems. Bikeways and pedestrian pathways, given short shrift in the past, are increasingly being considered serious options for reducing CO<sub>2</sub>-polluting car miles and for promoting healthy and sustainable lifestyles in urban centers. The \$4-dollar-a-gallon experiment in the summer of 2008 demonstrated a significant and continued increase in ridership on mass transit buses and trains.

Increased application of aerial coverage and spatial analysis is required to work with the planners and communit-

ies to find new alternatives for moving the masses. From impervious surface assessment to hydraulics to National Pollution Discharge Elimination System (NPDES) reporting, transportation engineers and

planners require more remote sensing and better integrated spatial database systems to do their jobs more effectively.

Tree planting, biological corridors, waste water and water systems, land-

scape architecture, airports and harbor construction, wetlands protection, and community planning are all components of the new green engineering enterprise philosophy that is required to design and construct a healthier and more sustainable world around us. Remote sensing and GIS are paramount for both creating and integrating the spatial information technology framework for engineers.

Importantly, these spatial technologies are critical for engaging decision-makers and other citizens in visualizing and comprehending the scope and magnitude of green engineering operations. Citizen support is mandatory to maintain comprehensive infrastructure re-building. Scientific visualization, using remote sensing and GIS, was credited by Maryland's Governor Glendening for the historic passage of the Smart Growth legislation. We know it works. Now is the

## Spatial data and decision support systems will serve a crucial role in re-engineering a green and sustainable society.

time for this community to unabashedly promote spatial technology for the new green engineering revolution. President Obama's Infrastructure Stimulus package will require nothing less to succeed. ☞