Telecom Connections

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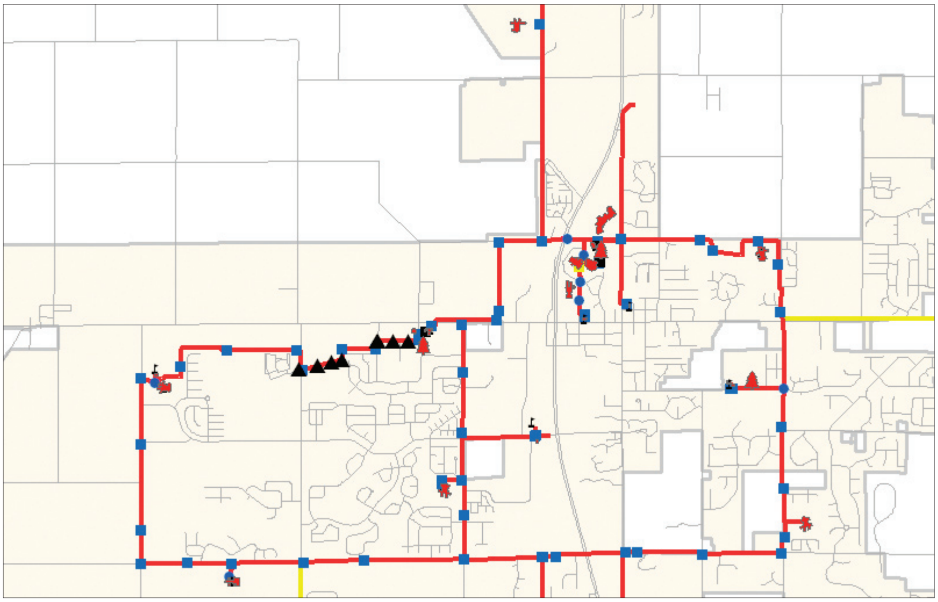
In This Issue

City Leverages GIS to Jump-Start Fiber Marketing Initiative

Economic opportunities are scarce these days, so when administrators for the City of Westfield, Indiana, identified a way to encourage business retention and growth in the community, they acted quickly. They saw a chance to leverage an existing—but mostly unused—fiber network to offer local businesses more diverse and cost-effective access to high-speed Internet. In developing a marketing plan for this outreach, they devised a way to leverage the city's existing geographic information system (GIS) datasets to generate potential customer leads.

Westfield, a city of more than 23,000 residents, is located just north of Indianapolis in Hamilton County, which ranks as the fastest growing county in the state. Its original fiber network was established by Westfield-Washington Township School Corporation to provide district schools with economical access to broadband. The 72-strand fiber system delivered fast connectivity, but 35 percent of its capacity remained unused because of the small number of clients (10 schools and 4 municipal and public safety buildings). In addition, the outside plant design was linear, which could not provide redundant backup connectivity should one of the branches go down.

To remedy this design problem, in 2008 the city and school system formed a joint venture, Westfield Connects, with plans to update the network to a 15-mile-long hub-and-spoke, local loop design that would improve service reliability.



This map shows the fiber network established for area schools.

The improved design and available dark fiber created an opportunity to offer dependable voice, video, and data services to local businesses through broadband service providers. The challenge was to present an economic opportunity that would entice service providers to participate. This was accomplished by making the city's dark fiber available to the service providers, forming partnerships with them through an open service provider network, and devising a marketing plan that generated confirmed sales leads.

"This created a win-win situation," said Eric Bishop, Westfield Connects fiber marketing coordinator. "Service providers avoid the expense of installing and maintaining the fiber network, so they gain customers with very little asset investment. Businesses gain by having access to fiber broadband services in a competitive market." The city also gains by recovering the cost of the new fiber infrastructure through revenue sharing agreements with service providers.

To generate sales leads, Westfield Connects personnel needed a marketing plan to identify potential customers near the fiber network and create a list of their addresses and phone numbers.

The city's Informatics Department already maintained a GIS, based on ESRI's ArcGIS Desktop and ArcGIS Server, to track fiber infrastructure assets and manage land parcel

continued on page 2

continued from page 1

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information. The department works in tandem with city officials, departments, staff, and community partners to advance the mission of the city and its departments and citizens. Leane Welsh, a GIS and information systems analyst in the department, devised a way to use GIS to merge data from several sources and generate the contacts list.

Viewing the infrastructure and parcel datasets on a map showed that existing fiber was near approximately 650 parcels. Commercial buildings would provide the highest density of target customers. Using GIS to establish a connecting network of parcels on each side of the network, 750 serviceable address points were identified. The next step was to match phone numbers with the addresses so sales calls could be made.

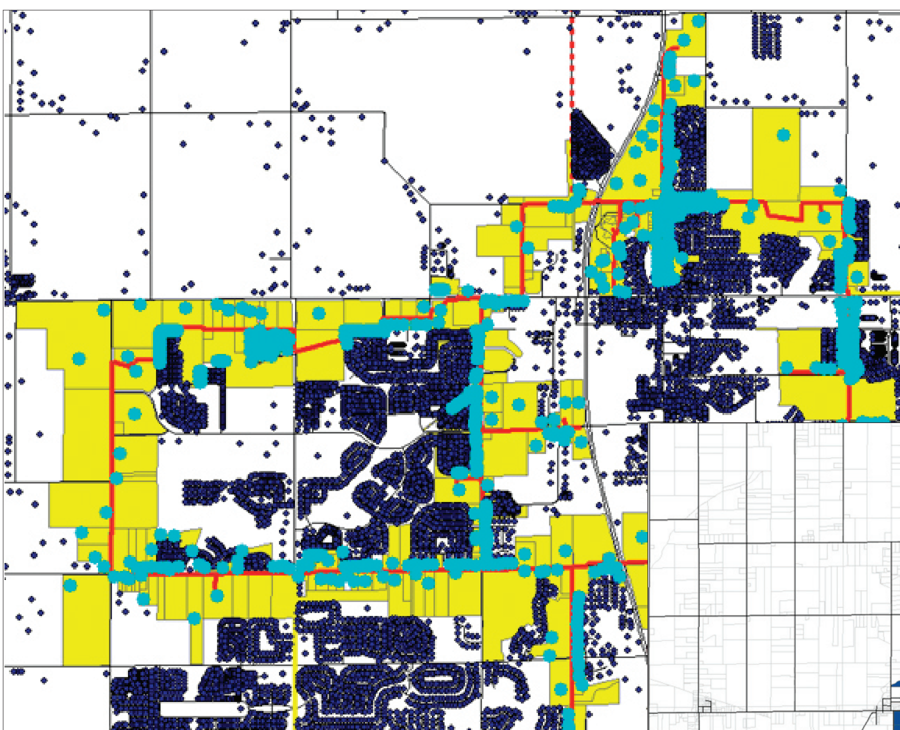
The city also used a water and sewer utility billing management system, which provided an account database containing both addresses and phone numbers. The solution was to merge the parcel and utility databases by matching the address fields, which would align phone numbers with addresses. The city's parcel dataset held E-911 address points, which made it a very reliable dataset, and the merge produced an 85 percent match on the addresses. The remaining phone numbers were obtained by making online searches using owner/business names.

ESRI technology also enabled shared access to the data online and through Microsoft SharePoint. Through ESRI's ArcGIS Server technology, the Westfield Connects team could view the information online as interactive maps. "We also developed a database site on Microsoft SharePoint, which we call Fiberforce, that uses the GIS data to aid in sales leads and customer relationship management," said Welsh.

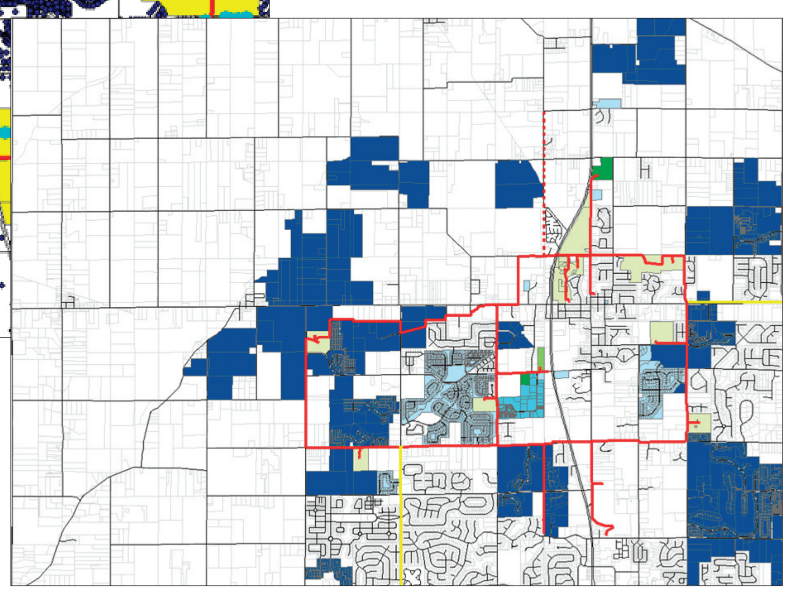
The contacts list brought the team to the next step, contacting first-tier targets (building owners) to offer service for an entire building. The premise was that the owner would see the advantage of providing broadband access as an added value to tenants. Second-tier marketing efforts were directed to individual businesses. All confirmed sales leads were passed on to the participating service providers for further action.

In just one year of operation, Westfield Connects attracted three service providers that are now using the network, and two competing providers have shown interest. City businesses using the network are already reporting savings. IMMI, an international company with corporate headquarters in Westfield, found it could reduce monthly costs by about $1,500 by switching to VoIP phone service and thereby converging its data and voice services onto the fiber network.

For more information on Westfield Connects, contact Eric Bishop at ebishop@westfield.in.gov or visit the Public Works Department Fiber Division page at www.westfield.in.gov.



A map combining the fiber network and city parcels identified 750 serviceable address points.



Short-term service expansion projects are shown in light blue, with possibilities for future growth in dark blue.

Telecom Trends

By Randy Frantz
Telecommunications & LBS Industry Solutions Manager
ESRI

Building the Broadband Highway: A Global Trend and a Complex Journey

February 17, 2010, marked the first anniversary of the American Recovery and Reinvestment Act of 2009 (ARRA). ARRA is providing $7.2 billion for broadband mapping and expanded broadband access programs. An anniversary is a good time to reflect on the progress of broadband and expectations for the future.

The United States isn't the only country funding a broadband expansion program. Other nations are recognizing that the road to economic development will travel over the broadband highway. When it comes to highways, the fastest ones will get you there first. Canada's Economic Action Plan will provide C$225 million over three years to expand into unserved communities. Finland passed a law decreeing that access to a 1 Mbps broadband connection is a right and is considering expanding that right to 100 Mbps by 2015. Australia is planning to invest AU$43 billion over eight years in the National Broadband Network. The network will deliver 100 Mbps over fiber to 90 percent of all premises, with the remaining 10 percent, mostly rural areas, receiving 12 Mbps or more through wireless technology. As a testament to the fact that this is a race with no finish line or ultimate winner, South Korea, long considered a leader in the deployment of broadband infrastructure, has embarked on its own US$24.6 billion, five-year plan to increase broadband speeds from 100 Mbps today to an impressive 1 Gbps.

Having closely followed the ARRA broadband mapping initiative, I thought it appropriate to review the accomplishments related to broadband mapping but, to my dismay, found this review to be more time consuming and challenging than expected. I assumed the easiest task would be to summarize ARRA grants to states for broadband mapping, but the tracking sheet I developed for personal use was incomplete. I couldn't find the award for New Jersey. Did I miss the announcement? I checked the National Telecommunications and Information Administration (NTIA) site for press releases but failed to find it. How could I speak authoritatively about broadband programs when I couldn't find the mapping award for one specific state? A week later, I finally found the New Jersey award announcement. I wasn't crazy. I didn't miss it. The press release had gone out that very morning. This raised a thought-provoking question. If it was difficult to track state mapping projects, how could anyone track and manage a national plan with $7 billion in funding?

I can only imagine the challenges that Rural Utilities Service and NTIA face in weighing the merits of the overwhelming $28 billion in broadband requests that were submitted for just the first round of funding. I realize we really do need an interactive national broadband map not only to identify broadband coverage areas but also to track progress in reaching unserved and underserved areas. While attending two Congressional Internet Caucus Advisory Committee events in Washington, D.C., in January, I saw Michael Ramage, executive director of Connected Tennessee, demonstrate the new interactive broadband mapping application for Tennessee (which was built using ArcGIS Server). His map of the state's broadband coverage revealed an unserved neighborhood situated between two well-served areas (see the map on page 7).

Service providers were unaware that they had bypassed that neighborhood. Upon learning of the error, they immediately developed a plan to expand into the neighborhood. This example made the Tennessee mapping project an immediate success—courtesy of a GIS-based solution.

The date to deliver the formal National Broadband Plan to Congress was March 17, 2010. I expect the plan to make extensive use of GIS for coverage mapping and broadband project tracking. The hope is that we will continue to see many success stories like those of the (formerly) bypassed Tennessee neighborhood.

Best regards,

Randy

Enterprise GIS Turns Infrastructure Data into Valuable Business Intelligence

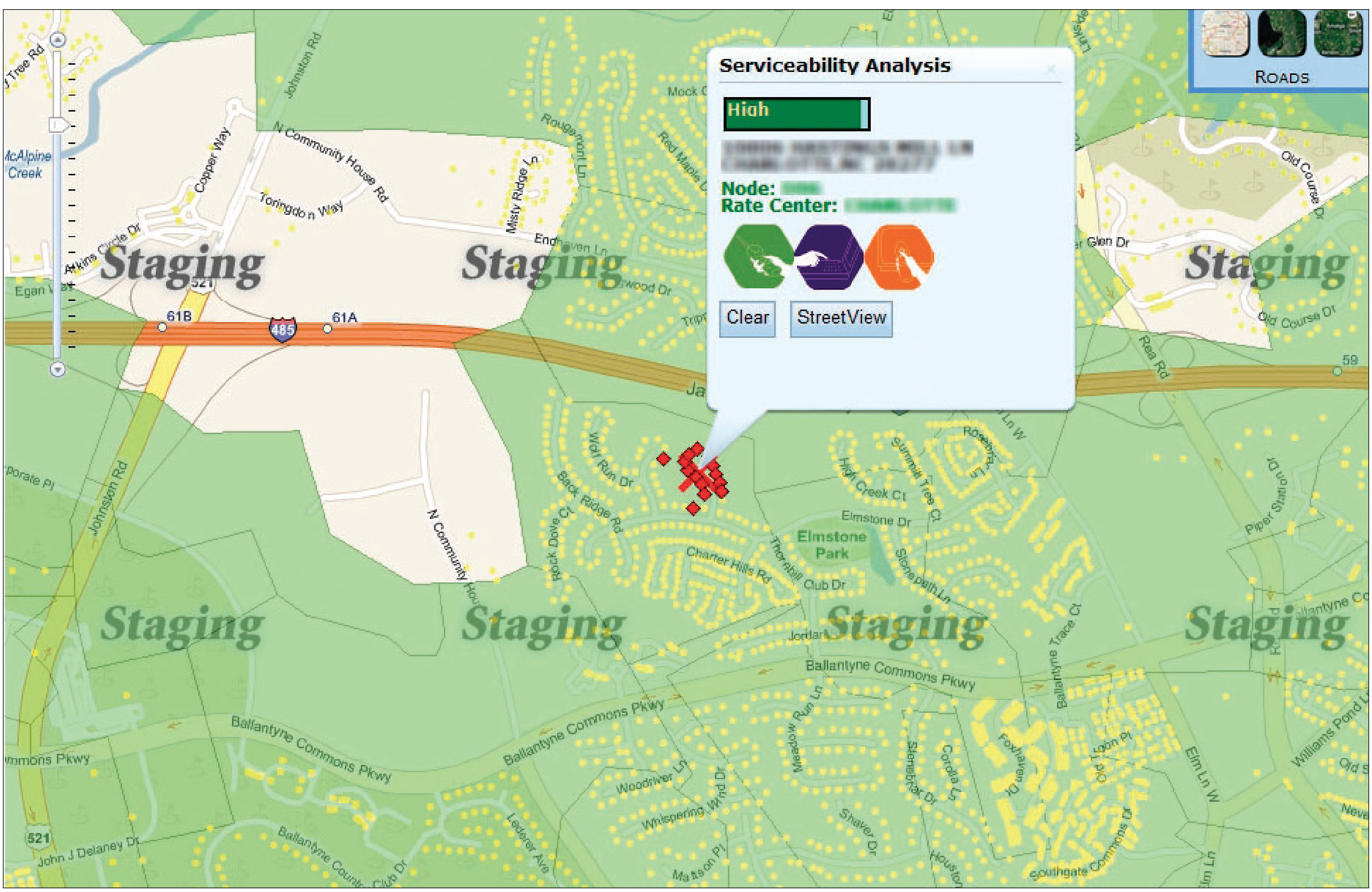
A cable provider sales representative is at that critical moment when a potential client asks, "Can you provide cable at my location?" The representative knows that an affirmative answer is a crucial step toward closing the deal. Many cable companies rely on a manual procedure and, often, guesswork to determine serviceability for an address that is not already in their billing system.

In most cases, a client's serviceability is determined by a field visit, which results in numerous wasted trips to addresses where paying customers cannot be served. In addition, no client feels happy when told to wait a day or two for a technician to visit the residence and report back to the sales representative. Immediate and accurate determination of serviceability shortens that moment between service request and point of installation.

Take the example of a large cable company that determined that such a system would save resources, time, and money and keep clients happier. At the same time, the company saw that an additional mechanism that recorded client requests would provide valuable data that could be used in marketing or network build-out analysis. The company had already invested in a migration of CAD data to an ESRI GIS technology platform to keep track of its cable network, and adding a serviceability application could provide an early win for the cable company's GIS team. The company chose Enspiria Solutions, an ESRI business partner based in Greenwood Village, Colorado, to create the serviceability application. The goal was to enable the sales representative to type a residential address on a computer keyboard and receive a visual, reliable answer about the address's serviceability—while making the client wait only a few moments.

The creation of a serviceability determination framework consists of many milestones. The factors that compose the concept of serviceability may vary from company to company. For this article, serviceability is defined as the quality of a specific physical address that measures the probability that it can receive the products and services offered by a cable TV and services provider. The products are cable-provided services, such as cable TV, high-speed Internet, and digital telephony (voice over IP).

The determination of the serviceability of a particular address is made by overlaying the address point on the cable service territory. In this case, the service area polygons (node boundaries) were already available in an



Results of the Serviceability Analysis give customer service representatives detailed information about serviceability.

existing ArcGIS schema, leaving only the geocoding of the address to be performed. Once a residential address point location was known, a simple point-in-polygon service could be used to overlay the point onto the service territory.

Serviceability Algorithm

The serviceability of a given address is not a yes-or-no answer. It is the likelihood that the cable company will be able to serve the customer's location. At a high level, the algorithm has the following operands:

L x C = a percent score, where
L = location of the customer in relation to cable service territory
C = confidence that L is accurate

The determination of C in the high-level equation is the part that will change from company to company and, possibly, product to product. This confidence factor will also be adjusted over time as the results of the serviceability requests are analyzed. The components that make up this confidence factor are

- The geocode match score
- How far the address is located from the service territory

Each geocoder has a match score that determines the accuracy of the geocode. The higher the match score, the higher the confidence. Another key measurement is the location of the address in relation to the service territory of the cable company. If an address is found to be well within service territory boundaries, the score is higher. However, there are less apparent findings as well. Quite often, addresses that are just outside the territory are serviceable, leading the algorithm to be modified to give positive results for addresses close to, but not within, the service boundaries. This distance is the main adjustment point in the algorithm and, often, an indicator of the accuracy of the GIS service boundary data.

Persistence and Data Analysis

An effective serviceability framework will save resources on the front end by requiring fewer truck rolls, but it can also do more. Saving, or preserving, a serviceability request is an important facet to any serviceability framework and therefore to the GIS data model. Once saved in a database, the requests can be analyzed to support other processes such as

- Network build-out planning—If an area has a high number of serviceability calls, a quick return on a new network is likely.
- Marketing—An existing service area with few serviceability requests could mean a marketing blitz is needed to perk up awareness.

Application

Starting with the data entry point, a lightweight, simple application is the best practice. Despite all this talk about algorithms and probabilities, Enspiria ultimately designed a computer screen that provided

- An easy form for entering address data
- A simple map to display the address and cable GIS data
- An unequivocal answer to the serviceability question

Enspiria senior software engineer Glenn Goodrich utilized ESRI's ArcGIS Server technology to design a straightforward Web interface.

"The ArcGIS API for JavaScript is a perfect fit for creating an intuitive Web experience because it enables end users to work with GIS without being GIS experts," said Goodrich. "The result is a simple form and map with minimal GIS controls."

Conclusion

The largest piece of the serviceability framework is the GIS, which provides the cable company with the locations of its own assets and potential customers. Preserving the serviceability information leads to an added ability to analyze the request database in support of many marketing and engineering functions. The serviceability framework will save money immediately and allow cable companies to more efficiently serve their customers.

For more information, contact Glenn Goodrich (ggoodrich@enspiria.com) or visit www.enspiria.com.

ESRI on the Road

Visit ESRI at the following trade shows and talk to the industry experts.

2010 CTAM Research and Insights Conference
Cable and Telecommunications Association for Marketing
May 12–14, 2010
Los Angeles, CA

UTC TELECOM 2010
Utilities Telecom Council
May 23–26, 2010
Indianapolis, IN

2010 ESRI International User Conference
July 12–16, 2010
San Diego, CA
www.esri.com/uc

Western Energy Institute Joint Use Conference
September 26–29, 2010
Vancouver, WA

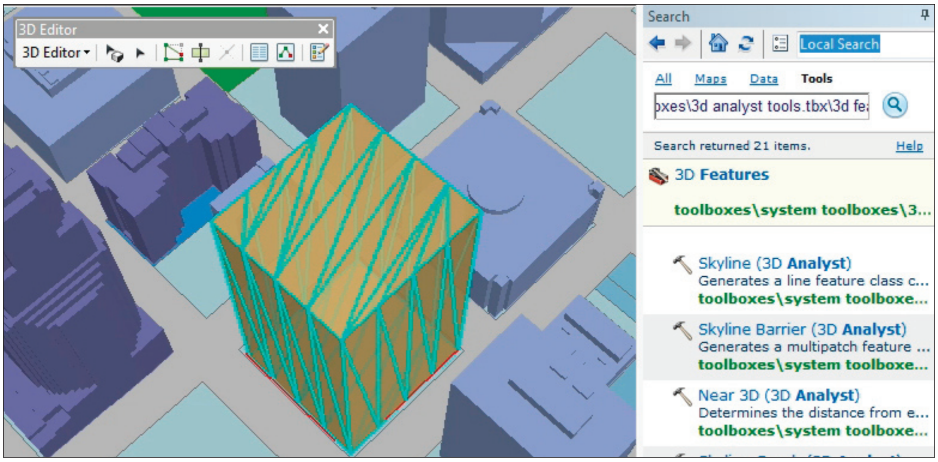
OSP EXPO 2010
Booth 637
October 13–14, 2010
San Antonio, TX

SCTE Cable-Tec Expo
Society of Cable Telecommunications Engineers
October 20–22, 2010
New Orleans, LA

New Innovations in ArcGIS 10

Read more and view demo videos about ArcGIS 10 by visiting www.esri.com/whatscoming.

The ArcGIS 9.4 version has a new name: ArcGIS 10. Projected for release in the second quarter of 2010, ArcGIS 10 is a major release that dramatically transforms how people use and apply GIS. Various new features help you perform your GIS work faster. Following are just some of the ArcGIS 10 innovations.



The new ArcGIS 10 search tool locates maps, data, or tools, as in this search that returns a list of new 3D editing tools.

Streamlined Productivity

- Search by keywords or data types to find data, symbols, and maps quickly.
- Browse and add data directly from Catalog window in ArcMap.
- Save time through faster display, smoother navigation, and the ability to run geoprocessing in the background.

Spatial Analysis

- Combine ArcGIS with other scientific programming to reveal powerful answers in your data.
- Create, manage, and visualize time-aware data for more in-depth analysis.
- Perform in 3D virtually everything you can do in a 2D environment.

Access to Imagery

- Experience faster performance with accelerated image display.
- Save time with the image analysis window for image interpretation and processing.
- Easily manage massive image collections with dynamic mosaicking and on-the-fly processing.

New Ways to Share

- Increase collaboration via tight integration with ArcGIS Online search and share capabilities.
- Easily create and distribute projects that may include data, layers, maps, tools, scenes, globes, diagrams, and add-ins.

GIS in the Field

- Leverage streaming GPS, photo attachments, and location tracking.
- Access a new iPhone mapping application directly from the Apple iTunes App Store or build your own.

Flexible Deployment

- Easily install and manage ArcGIS Desktop licenses.
- Leverage GIS everywhere: via Web-extended desktops, Web-hosed applications, and cloud GIS.

Better for Developers

- Use simple to deploy add-ins or Python to extend the desktop applications.
- Easily build applications with additional Web APIs and streamlined software developer kits (SDKs).

2010 ESRI International User Conference

July 12–16, 2010, in San Diego, California

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BroadbandStat Goes Live Online

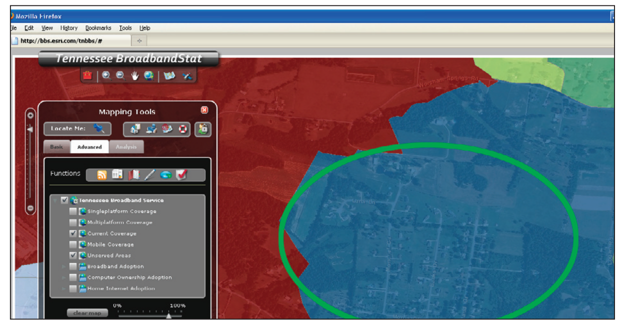
New Web GIS Application Maps Broadband Services in Ohio, Tennessee, and Illinois

By Susan Harp, ESRI Writer

Recognizing that the United States has fallen to fifteenth place in the world in access to broadband Internet services, Congress passed $7.2 billion in funding for expanding broadband services. The funding was part of the American Recovery and Reinvestment Act of 2009 (ARRA).

Some of the money was allocated for creating maps to show where broadband coverage currently exists in each state. ESRI teamed with Connected Nation to develop BroadbandStat, a Web GIS application, to meet this need. States can use BroadbandStat to map broadband coverage; incorporate information gathered from a variety of sources, such as service providers and survey assessments; and pinpoint where the expansion of new broadband services will help support local economic development.

Twelve U.S. states and Puerto Rico will use BroadbandStat to organize their broadband services data and make interactive maps available on the Internet. Currently, Illinois, Ohio, and Tennessee have launched their BroadbandStat Web sites and made them available to the public. (Visit Connect Illinois, Connect Ohio, and Connected Tennessee.)



BroadbandStat reveals this unserved neighborhood (marked by a green circle) in Tennessee that's ready for broadband service expansion.

"The assembly of data from major [broadband] providers is key to a comprehensive portrait of statewide coverage," said Morton O'Kelly, chair of the department of geography at Ohio State University. "As a geographer, I am immediately able to see significant regional contrasts as well as gain a greater appreciation for the challenges facing providers as they attempt to complete coverage in lower-density rural areas."

Online access gives people an easy way to learn about broadband access in their states. When the maps are complete, they can see where cable, mobile, or DSL broadband is available; show statewide results by census block; and zoom in on results all the way to the street address level. The menu also gives visitors one-touch buttons that map information related to each state's demographic data, broadband and Internet adoption rates, and computer ownership rates (when the data is available).

"Now, business and industry can use this tool for relocation decisions, home buyers can use this while shopping for a home, and government and ECD [Department of Economic and Community Development] can use it for planning purposes," said Daryl Phillips, executive director of the Hickman County, Tennessee, ECD.

In January 2010, ESRI and Connected Nation demonstrated BroadbandStat to policy makers, telecommunications industry executives, and government agency representatives at two Capitol Hill venues in Washington, D.C.: the Technology Policy Exhibition and State of the Net Conference. Both focus on federal information technology policy. The Congressional Internet Caucus Advisory Committee, a private-sector organization that educates policy makers on Internet-related issues, sponsored both events.

Visit www.esri.com/bbstat to learn more about BroadbandStat and link to live sites.

BroadbandStat Data Model

The BroadbandStat data model can be used either as an interactive broadband mapping and analysis application or a foundation for developing a customized data model. To find out more, visit www.esri.com/bbstatmodel.

Everything GIS

For one week, in one place, you can find everything you need related to GIS. No experience is necessary.

Hear about the latest GIS innovations in telecommunications and connect with people who share your interests at the following User Conference Telecommunication Tracks.

Telecommunication Tracks

Tuesday, July 13, 3:15 p.m.
Regulatory Initiatives Leverage GIS to Enhance Broadband, NextGen 911, and Interagency Communication
Yildiz Technical University and RCC Consultants

Wednesday, July 14, 8:30 a.m.
Plan, Build, and Manage Telecommunications Network Enhancements with GIS
Penn State, Comporium, and Softbank

Wednesday, July 14, 10:15 a.m.
Leveraging Mobile GIS to Enhance Telecommunications Network Management
Level 3/3-GIS and Softbank

Wednesday, July 14, 1:30 p.m.
Leverage GIS to Enhance Telecommunications Operations
Presentations from ESRI staff

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