

A BIRD'S EYE VIEW

GIS technology is giving policymakers a new perspective.

BY ED SEALOVER

The New Jersey Legislature, like every other state government, has faced considerable budget shortfalls over the past several years. As part of the process for dealing with the decline in revenue, officials decided to reduce state aid to municipalities.

Under the plan put forth several years back, cities, towns, boroughs and villages of 10,000 people or less would have faced particularly stringent funding reductions, and municipalities of 5,000 or less would have lost all state aid. All this was laid out in lists and charts on paper. One legislator, however, wanted to look at the plan from another angle and asked the Office of Legislative Services to put it in a map.

Using geographic information system (GIS) technology, the office laid out locations of small municipalities taking the biggest hits and showed that in some counties, almost all local governments were affected, said Raysa Martinez Kruger, senior research analyst. Though Kruger doesn't know exactly how the mapped information was used, she does recall that former Governor Jon Corzine's funding plan ended up changing slightly.

New Jersey is not the first state government to use GIS, but its experience is a good example of how the computerized mapping technology is becoming more commonplace in research and policymaking decisions. Although GIS may not uncover new information, Kruger and other proponents say it lays out statistics in a way that helps users interpret them in a new light.

"What GIS provides is the visual presentation of the data," Kruger says. "And I suppose that's achievable through a spreadsheet,

Ed Sealoover covers state government for the Denver Business Journal.



maybe pie charts or graphs. But the map communicates different information that can not be communicated in any other method, typically geographical."

Yes, the same technology that powers Internet driving-direction sites is now making its way into statehouses across the country. And its variety of applications is as diverse as the states that are employing it.

POPULAR WITH REDISTRICTING

Explained simply, GIS technology takes masses of information on any subject—from population projections to foreclosure listings to bark-beetle-killed trees—and overlaps those statistics with a map of the city, county or state for which the numbers are pertinent.

The earliest legislative uses of the tool were simple informational maps. Pennsylvania worked with research universities that had access to GIS systems in the mid-1990s to lay out maps of legislative districts that included information on districts' racial

makeup, income averages, home ownership and other variables. The maps became hugely popular among legislators seeking to know as much about their constituents as possible, says Sean Gimbel, a senior research analyst and GIS specialist in the state's Legislative Office for Research Liaison.

The most common use of GIS now is in redistricting, according to Kruger, who conducted a survey on how states use the technology. Eighteen of the 27 states responding reported GIS was used for research, and 14 of those states provide it for redistricting and similar purposes.

But while using the tool to understand constituencies is a simple and effective use of the technology, a number of states are using it to drill down on larger topics, too.

Montana, for example, has used the system to lay out a map of the "red dead" trees in its forests that are suffering from the current bark-beetle infestation, says Dick Clark, chief information officer for the Treasure State.



REPRESENTATIVE
JON SESSO
MONTANA

of complex information,” Meilleur says. “I think that’s the beauty of it.”

What lies around the corner, many GIS professionals predict, is using the technology to show not just where funding has gone but where it should go.

Minnesota, for example, has used GIS technology to list the predominant home languages spoken in each school district, Meilleur said. That information proved very popular in planning funding for English as a Second Language classes.

Missouri is gathering information from local governments to put together a map of

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**LEE MEILLEUR, GIS MANAGER
FOR THE MINNESOTA LEGISLATURE**

Officials input the location of the affected foliage, show the major areas that are dying, and give the resulting maps to state and county officials who are working on disaster-planning maps in case of a forest fire.

“GIS has the ability to lay out in pretty good detail how much of the forest is red, and then we give it to the professionals to let them figure out what to do with it,” Clark says. “It’s up to the professional community in any one of these disciplines to use GIS and figure out how it can be used.”

Montana Representative Jon Sesso says those maps can help lawmakers make decisions. After wildfires tore through Montana in 2007, the General Assembly called a special session to determine how to prevent future fires. One of the main tools that was used to explain key issues in the debate was a GIS map. Legislators could easily see the source of the wildfire problem and figure out ways to attack it. They decided to make additional investments in efforts to cut down

on the fuel available for wildfires.

“A better understanding led to enough legislators willing to invest in fuel reduction,” Sesso says. “The tool allows us not only to describe and explain the situation better, but by all means it leads to better decisions.”

FOLLOWING THE MONEY

The federal government uses GIS to track its stimulus spending and show Americans where their money is being spent. Now states are figuring out ways to employ the technology to show where tax funds are going.

Minnesota is putting together an accessible GIS map that will show which projects are receiving money from a sales tax increase approved two years ago, says Lee Meilleur, GIS manager for the Geographic Information Services office of the Legislature. It will allow residents to see the products of the tax hike in a way no listing in a document could, he says.

“It provides a picture, a basic map picture,

the New Madrid Seismic Zone.

The map will identify buildings and their uses at each address, helping to let emergency officials know who might be there in the event of an earthquake or other natural disaster, says Mark Duewell, a program manager with the Missouri Spatial Data Information Service. It can be used in planning disaster response and can, with its creation, be a time- and life-saving alternative to looking up information about a particular building or property on an Excel spreadsheet, he says.

“They’re very unwieldy and potentially time-consuming to use,” Duewell says of the spreadsheets that now contain the vital information that could help state governments figure out how to deploy resources before or during a disaster. “If you stack them up, they’re sometimes 10 feet high.”

Missouri also has begun to explore other ways to use the technology, Duewell says. Its revenue department uses mapping to study

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information that will help it develop regulations and standards. And the state is looking at mapping demographic information to figure out ways to determine exactly where economic development funds need to be targeted.

In fact, Duewell says, the state has trained professionals beyond the standard computer experts on how to incorporate GIS technology into their research and planning. Even biologists working with fish populations can use it to track work and determine what needs to be done next, he said.

Some federal grant programs now require states applying for money to support both its need and proposed uses for the cash with mapping programs, Duewell says. The map, more so than any chart or written explanation, can allow groups to see how the money is being used.

In mid-March, for example, Duewell submitted a proposal for a \$100,000 U.S. Geological Survey to help local governments with emergency response plans. As part of the support for his proposal, he had to submit a GIS map of the project area.

The federal government also is requiring GIS evidence of need as it determines where to award its Transportation Investment Generating Economic Recovery grants, says Rich Leadbeater, state government industry solutions manager for ESRI, a pioneering GIS company that works extensively with governments. President Obama has asked for the

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MARK DUEWELL,
PROGRAM MANAGER, MISSOURI
SPATIAL DATA INFORMATION SERVICE

departments of Transportation and Housing and Urban Development, and the Environmental Protection Agency to overlay their maps and work together to find a needed connection between housing areas, transit areas and highway funding.

SHARE AND SHARE ALIKE

But while states may be finding new ways to justify and track spending with GIS technology, the biggest benefit to the largest number of people may still be on its way—once governments learn to combine the information they’ve received through GIS research and to use it for mutual benefits.

The MidAmerica GIS Consortium, for which Duewell is a director at large, has been working with state and local governments to encourage sharing information, especially on subjects that range beyond state borders. Public safety planning like the New Madrid project is a prime example of how states can put research into one location to be available

to a variety of governments at a time when more than one agency may be working on a disaster or a project, he said.

“The other thing about GIS is it’s the great translator. It takes information from different sources and puts it all together,” Duewell says. “Because it’s the great translator, it works across state borders very well. ... It’s looking at policy together instead of in silos.”

There are, however, a few minor drawbacks, officials say.

Although legislatures love the results that GIS produces, they still have to figure out how to pay for it, Clark says.

And right now, legislatures are falling behind governor’s office in their use of GIS technology and their ability to control the message on issues like budgeting, says Leadbeater. A number of governors, for example, have used GIS technology to set up maps of where federal stimulus funds are going and to be able to speak directly to voters about how they are spending taxpayer money. Residents then begin to believe the person communicating the message is the one in control of the funds and do not consider the role of the legislature in controlling the state’s purse strings, he says.

One potential problem is the more officials are able to use GIS, the more expectations may grow beyond what is reasonable for the technology, Meilleur says.

But that is also the benefit of the limited use of GIS so far, a number of people involved with the technology say. People probably haven’t even begun to think of all the ways it can be used to lay out information in a way that will inform policy. And with each question that GIS answers, there are more questions needing more research that can employ GIS.

Although Kruger found that nine of the 27 states responding to her survey do not employ GIS technology in policymaking yet, she believes it’s only a matter of time before that number reaches zero.

“What it really helps you do is find information in a visual, data-intensive way,” Kruger says. “We won’t know what it can do until people start asking questions about what they can get from it.”

CHECK OUT a Q and A with Rich Leadbeater, state government industry solutions manager for ESRI, on how GIS is used in state government at www.ncsl.org/magazine.