



## GIS in Public Policy: Using Geographic Information for More Effective Government

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*GIS in Public Policy* is part of the ESRI Press Case Studies Series. In this series, the applications of ESRI geographic information system (GIS) software in different fields, such as natural resources, energy and landscape architecture are explored. As in other books in the series, the graphic design of *GIS in Public Policy* is beautifully rendered to form a visually stunning book. It is full of colorful photos and maps—perfect for those short on time, attention, or both. Also like the other books in the series, *GIS in Public Policy* can be seen a marketing tool to showcase the many uses of ESRI software.

The intended audience for the book seems to be practitioners in government and their consultants who are not currently using GIS and who are interested in how to use GIS to assist with policy problems. This book would not directly help GIS professionals in government because that group does not need convincing about the usefulness of GIS, and the book does not go into technical details about the analyses used in the cases. GIS professionals could benefit from the book if decision-makers in government were to read it, get excited about the possibilities of GIS, and increase funding for it. This may be the most effective use of the book, which, in the introduction, touches on an important lesson learned by case study participants—“for GIS to make a difference for an organization, its power must be recognized by the leadership.”

When I first picked up the book, I was hoping for a broader look at how GIS has affected public policy studies. In my studies of public policy at the University of Chicago, the quantitative methods of choice were statistics and economics; spatial analysis

was not taught. Some questions I was hoping the book would address are: Has GIS made a difference in the practice of public policy? What kind of problems does it solve that were difficult or impossible to solve before? What are the limitations? How widely is it being used? What level of investment and staff time is needed, and is it worth the effort? Unfortunately, the book did not address any of these questions, except to give specific examples of some of the problems in which GIS was useful.

Another minor critique I had about the book was its tone, which is a bit self-congratulatory. Each section begins with a stubborn public policy problem that miraculously gets solved with ESRI products. Despite its tone, the book contains some interesting case studies that should inspire even the most technophobic reader.

The book is split into six chapters, with two or three case studies per chapter. The chapters cover education, health and safety, public services, environment, social services and international. Within the education section is a remarkable case involving Fresno County’s Office of Education in California. They had been using outdated nine-track tapes and the maps-on-the-floor method of calculating the number of low-income students each school had in order to estimate how to distribute federal funds. After converting to ArcView GIS shapefiles and joining the databases from several sources, 550 hours of staff time and \$22,000 were saved. What is remarkable is not only how much they saved, but how many other school districts are likely doing it the old-fashioned way.

Another good case study in education is The Weed Project in a rural Idaho school. The students are using global positioning systems to map a noxious weed that is damaging watersheds, wetlands, and range land. The students are compiling their information into a weed basemap and giving it to the County Weed Superintendent, who is in charge of eradicating the weeds. Prior to this project, the Superintendent did not know where the weeds were located and lacked the resources to gather this information. An interesting note about this project is how fast the students picked up ArcView GIS and other computer skills; the students not only taught ArcView to one another but also to the teachers. These case studies demonstrate the manner in which GIS can be useful for school planning as well as in the classroom.

In the health and safety chapter, the author documents case studies in crime mapping and public health. GIS-based crime mapping can be seen as taking pin mapping (paper map on the wall with stickpins for each crime) to the next level. In addition, police are using GIS to solve multiple crimes at once by confronting a suspect with a map of crimes. They have found that this induces the suspect to confess to additional unsolved crimes.

GIS also enabled a county in Washington State identify the extent to which a Medicaid program called “First Steps” was being used. The program’s goal is to prevent low birth rates by providing extra prenatal services to pregnant women. Yakima County staff geocoded its Medicaid births and all “First Steps” births to see the percentage of mothers the program was reaching in different areas of the county. They identified three cities with lower than average “First Steps” usage and made plans to target these cities with more education about the free program. Each example shows how GIS was used in daily public safety and also to assess and redirect the implementation of a public health program.

In terms of public service, the city/county of Indianapolis’ GIS program is a good example of the way in which a metro government can utilize GIS to increase the effectiveness of its services and communication. Indianapolis was having difficulty in managing snow removal after big storms. This resulted in wasting money because of such problems as some streets being plowed twice and some none at all, which was a perennial source of embarrassment for the city. The Mayor pushed to find a solution, which resulted in a GIS application called “Snow Fighter” that keeps track of snow removal progress and cost. Another GIS solution is the Data Viewer, which allows all staff to view and use GIS data. Additionally, the GIS is available to the public through

the IndyGov Web site and citizens are allowed access to services such as custom bus routes, permits, and reservations to parks.

In the environment chapter, the author describes how the drinking water of Boston, Massachusetts has improved. For years, state legislators tried to pass the Watershed Protection Act, a bill that would preserve land near the rivers and streams leading into Boston’s water reservoirs. However, citizens in western Massachusetts who lived near the reservoirs blocked the legislation out of fear that it would lead to widespread land-use restrictions. Once the 200- and 400-foot buffers were displayed graphically using GIS, the opposition evaporated and the measure passed. The map communicated better than words that the buffers affected a minuscule amount of land.

An interesting case study is presented in the social services chapter of a ride-share program set up to provide nondriving senior citizens the mobility they need. Elderly people call in and specify where they are going, what time, and how many passengers they are willing to ride with. The operators use GIS to analyze all the inputs and optimize the route and the cost. The program is self-supporting and very popular. This is an example of how GIS can resolve complicated logistics problems.

The international chapter contains an example of the manner in which the USGS responded to the Hurricane Mitch emergency by creating the Digital Atlas of Central America and distributing it for free to relief agencies. In addition, the USGS used their successful use of GIS to lobby for \$1 billion in disaster prevention funds, including the mapping of floodplains. This case illustrates how geographic information is vital to efficient response to disasters. It also showcases one of the most important applications of GIS—it can be used to minimize loss of life and property from natural disasters through more informed land-use planning.

#### **Reviewed by:**

Laura Pinna received a Master’s of Environmental Management from Duke University and a Bachelor of Arts in Public Policy from the University of Chicago. She works as the GIS Analyst for the Town of Oro Valley, Arizona. She serves on the Technical Advisory Committee for the Pima Association of Government and the Regional Electronic Plan Submittal Committee, an effort to set standards and protocols for electronic plan submission.