Esri SMART COMMUNITIES

CASE STUDY SERIES

SAN DIEGO

SAN DIEGO ASSOCIATION OF GOVERNMENTS (SANDAG): THE VALUE OF GIS FOR REGIONAL COLLABORATION

San Diego County, California

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COMMUNITY PROFILE:

San Diego County, California

Population Size: 3.28 million (2016 California Department of Finance estimate)

GIS Program: Hybrid, with agency-level support under the SANDAG Technical Services Department, and additional use in multiple program areas

Number of Departments Using GIS: GIS is used throughout the organization

Total FTEs: 7 and one intern

Core GIS Budget: $1.5 million (staff, support costs, and contracted services)

What Is a Smart Community?

Local governments are looking for ways to build safe, healthy, resilient communities for their constituents. Citizens are calling on governments to be more transparent, efficient, collaborative, and productive. A government that meets these challenges is a *Smart Community*. How will you strive to meet these needs?

Technology is the defining factor for a smart community. It is modern technology that enables departments to increase communication, effectiveness, and openness. Technology gives governments and their citizens access to powerful information that they can leverage to make more informed decisions.

Smart Communities promote efficiency. Time no longer has to be wasted in duplication of efforts by different staff. Departments can now share relevant and timely information throughout the organization, helping staff across all departments collaborate and deliver a higher level of service. With a common information system like GIS, staff have access to the tools they need to create, manage, and share authoritative information and applications.

It doesn't matter how big or small your community is, where you are located, or how unique your needs may be, *any* community can be a Smart Community.

SAN DIEGO ASSOCIATION OF GOVERNMENTS (SANDAG): THE VALUE OF GIS FOR REGIONAL COLLABORATION
San Diego County, California

Whether defined by city limits or county lines, local governments face challenges that don't stop at designated political boundaries. Using a regional approach for delivering services especially makes sense in the development a GIS program. By pooling resources and data, local governments can do more and achieve more together. In the San Diego metropolitan region, local governments have been working together since 1966, initially under a state authorized joint powers agreement, and from 2003 on as a state-mandated regional agency. As it was first called, the Comprehensive Planning Organization served as a long-range planning department within the San Diego County government for the greater San Diego region. In 1980, the organization was renamed the San Diego Association of Governments (SANDAG).

SANDAG is governed by a board of directors with representatives from each of the nineteen local jurisdictions that make up the region. In addition to these voting members, SANDAG has numerous regional stakeholders who serve as advisory representatives: Imperial County, U.S. Department of Defense, California Department of Transportation (Caltrans), San Diego Unified Port District, Metropolitan Transit System, North County Transit District, San Diego County Water Authority, and Southern California Tribal Chairmen's Association. The government of Mexico also serves in an advisory role because of the binational nature of regional transportation and planning issues.

SANDAG builds consensus, produces strategic plans, and provides a forum for regional decision making on long-range transportation issues. GIS technology has provided the region with a unique tool that lets local leaders see how projects will affect both their communities and the larger region. With so many jurisdictions in the region, there is a need for a larger, collective perspective and a more holistic approach to solving issues; GIS allows SANDAG to provide a broader picture of how regional transportation needs can best be addressed.

Tuna Harbor, Seaport Village, and the USS Midway Museum on the Downtown San Diego waterfront.

The SANDAG Data Surfer resource provides an easy-to-use interface to access current and forecasted demographic data and statistics.

GIS as a Planning Tool

SANDAG was an early adopter of GIS technology, beginning its implementation in the early 1970s. The agency launched its first project using GIS in 1971. "Esri has tens of thousands of customers worldwide. We're Esri customer number 54, which gives you some sense of how long we've been working with GIS," says Pat Landrum, Senior GIS Analyst. "We defined a need to develop a comprehensive system to support all of the types of statistical analysis we had to do in order to map out and set priorities for projects, along with setting up long-range transportation forecasts." GIS was a way for SANDAG to bring all its data and information into a computer-based system, enabling the agency to integrate data and develop forecasting and modeling applications early on. "That very first project became the building blocks for the system we have now," says Landrum.

Having GIS technology and data readily available has allowed SANDAG to address many planning issues, ranging from urban growth to transportation infrastructure needs, in addition to issues related to public safety, environmental concerns, and social justice. "GIS technology has been especially useful in displaying information on traffic patterns and regional growth. Without GIS, it would be hard to convey the impact of decisions," says Landrum. "Charts and graphs don't lend themselves to easy interpretation, but maps do."

As Landrum points out, once people understand how all the components of a project fit together—similar to the pieces of a puzzle coming together to form the complete picture—a number of different analyses can be done.
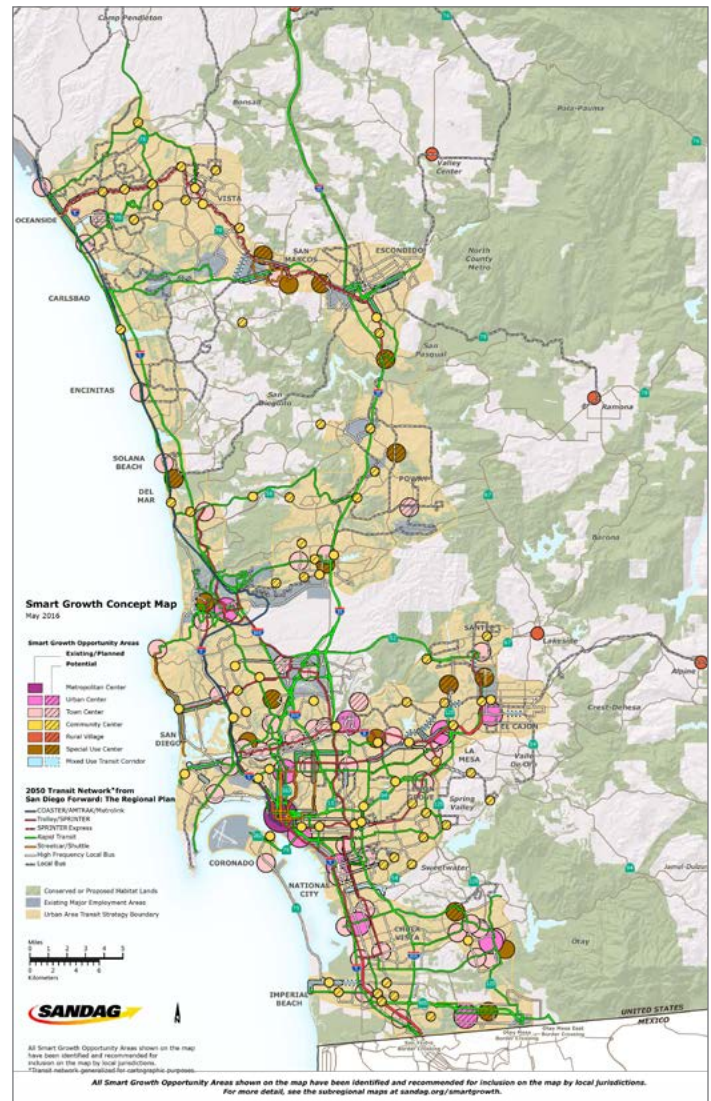
SANDAG Smart Growth Concept Map

For example, it's possible to look at where jobs will be created and where people will live in response to traffic patterns in the region. The technology also can help jurisdictions see where investments are needed.

Every four years, SANDAG adopts a comprehensive regional transportation plan for all its projects; the current Regional Plan forecasts through 2050. The long-range regional forecast helps delineate how phased-in projects are proceeding, where improvements may be needed, how the projects will be funded in the near term, and where program dollars are being spent. Without GIS technology, Landrum notes, it would be difficult to track and map this information over the long term, the level of sophistication of SANDAG's analyses would be greatly reduced, and the association wouldn't be able to provide the answers to the complex questions being asked by its governing board and the public at large. "We need to be able to keep in step with the demands of our stakeholders," he says.

The Power of Story Maps

SANDAG is always exploring ways to use new technology as it becomes available. Story maps provide a flexible, responsive, and easily used media format that can communicate work being done on projects. Furthermore, story maps require little technical knowledge of GIS. Incorporating maps, infographics, videos, and other types of images, the design of story maps allows users to quickly understand the impact of a project in a user-friendly format. SANDAG has undertaken a wide range of projects over the years. Story maps have allowed the organization to synthesize vast amounts of information related to those projects and present it back in an engaging and visual format.

TransNet—the region's voter-approved half-cent sales tax for transportation projects—has been funding projects for more than a quarter century. Voters first approved the 20-year *TransNet* sales tax program, which SANDAG administers, in 1987, and voted in 2004 to extend the measure for 40 years. To date, *TransNet* has funded highway expansions, trolley extensions, bike paths, local road improvements, and transit services. During the 60-year life of the measure (*TransNet* I and II), more than $17 billion will be generated for infrastructure improvements.

SANDAG officials wanted the public to know what projects had been completed since 1987 to better understand how public tax dollars are being spent. In 2015, SANDAG opted to compile all the information on what the *TransNet* program had accomplished over the years. Compiling the vast amount of data from multiple sources took three months. The agency's communications team oversaw this significant internal coordination effort. Once the data had been collected, it was presented in the *TransNet* story map. The story map provides a valuable history of how more than 650 highway, transit, bikeway, environmental, and grant programs and projects have been delivered through the *TransNet* program, effectively demonstrating where tax dollars are being put to work. And SANDAG continues to add content to the story map—in essence, creating a living, interactive document.

Feedback received from the public, as well as from the SANDAG Board of Directors, has been quite positive. The *TransNet* story map (KeepSanDiegoMoving.com /TransNet) was used in town hall meetings to explain to residents and other stakeholders what projects have been completed and what projects will be undertaken thanks to *TransNet* funding. From January to April 2016, the map had about 10,500 views, which compares well with other similar GIS web application projects. Additionally, a brief video developed to introduce the map (accessible at bit.ly/TransNetStoryMapVideo) was viewed more than 20,000 times in a matter of weeks. The return on investment has been significant as SANDAG is effectively using the map to engage the public through social media.
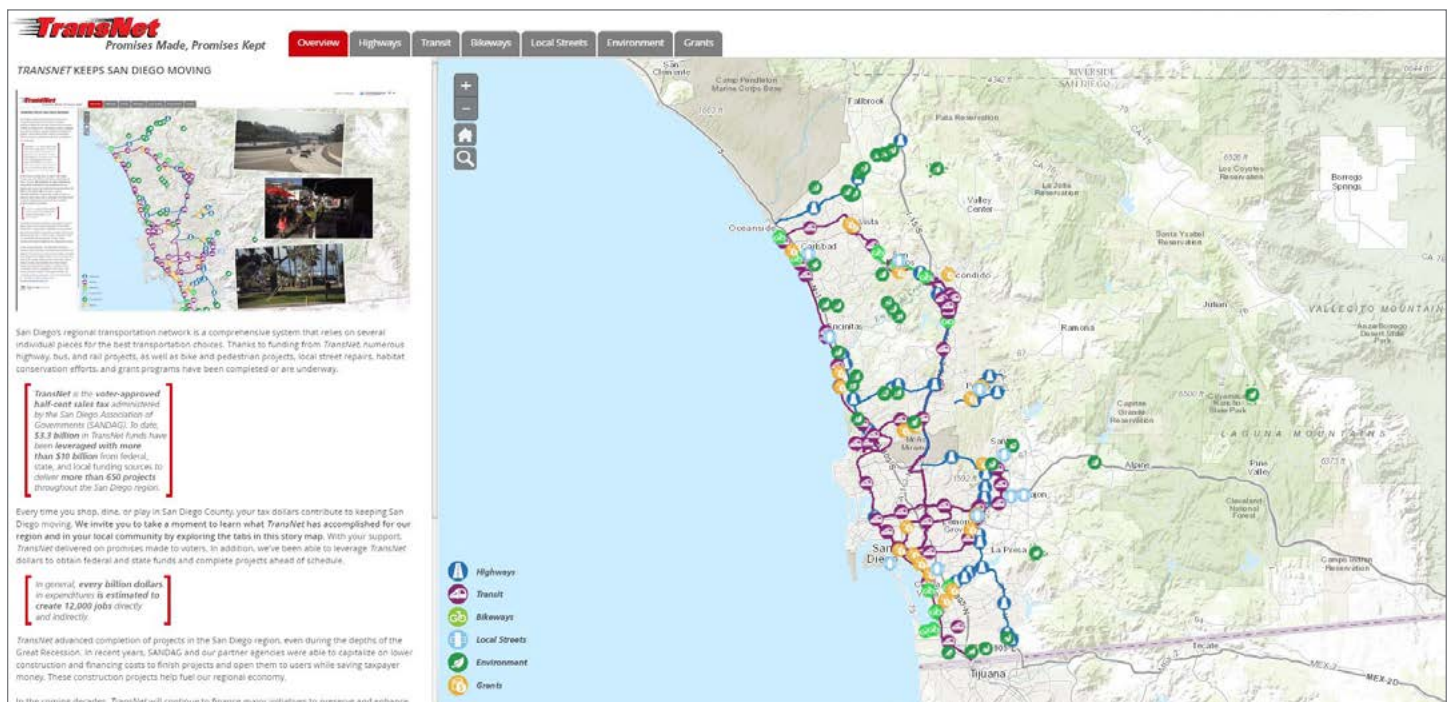
The *TransNet* story map is an information-packed, interactive application that displays details for a wide array of projects completed over the life of the *TransNet* program.
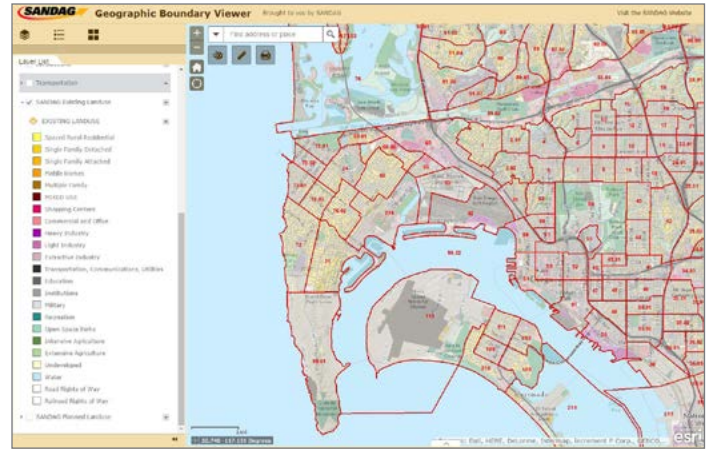
GIS mobile applications help streamline workflows in the field for law enforcement.

The use of the AGOL Web AppBuilder template helped streamline updating the SANDAG Geographic Boundary Viewer, which provides a central location for viewing administrative, district, and statistical area boundaries and information.

Modeling and 3D GIS

SANDAG has been using transportation modeling for more than three decades and will continue to do so, exploring new directions in data, content, and visualization technology. Continued input will help create a robust inventory of available data. For example, types of data for commercial and mixed-use development will include floor-area ratios, the number of beds and baths available in residential units, and employment characteristics. The goal is to have a refined level of data available to support SANDAG's activity-based model and to conduct spatial analyses. As to 3D GIS, SANDAG is working on a prototype project to create an urban canvas that can forecast outputs and support scenario planning and visualization. Among the GIS data layers to be developed for analysis are buildings (with detailed floor-by-floor characteristics), zoning, fees, and parking.

ArcGIS Online

SANDAG began using ArcGIS Online (AGOL) in early 2013 and has fully integrated it into its GIS framework. AGOL provides an effective platform for collaborating with internal workgroups by enabling GIS users and nonusers alike to share their content within the organization or with the organization's AGOL groups. While much of SANDAG's use of AGOL supports regional data sharing and open data initiatives, it also supports internal program workflows through the creation of simple applications that bring GIS data and program information into an easy-to-use, web-based interface without the need for heavy desktop GIS software. SANDAG also leverages AGOL's mobile solutions, such as Collector for ArcGIS, which support ongoing efforts to gather community input and field survey responses. The wide range of AGOL's out-of-the-box web application, mobile, and story

map templates provides SANDAG with a multitude of options to quickly and easily share information, and can also be customized by the SANDAG GIS team to support more advanced requirements.

Benefits of GIS

A founding member of the San Diego Regional GIS Council, SANDAG continues to work with the council to strengthen the regional GIS community, and it intends to stay at the forefront of the GIS field, helping its member agencies produce and share data and advance geospatial technology that supports both local and regional initiatives.

A key element of the San Diego region's forward-thinking regional GIS approach is the coordination between SANDAG and the San Diego Geographic Information Source (SanGIS), a joint powers authority of the City and County of San Diego. Through a memorandum of agreement, SANDAG and SanGIS provide GIS data and services to the public and private sectors through the Regional GIS Data Warehouse (RDW). The RDW has more than 270 data layers available for download to its 5,000-plus registered users; types of available data include parcels, street centerlines, imagery, and topography. Having the ability to share GIS data and information through the RDW results in a stronger regional GIS community, helps identify collaborative regional initiatives, and informs SANDAG on the best methods for offering more widespread services and open data solutions to member agencies and the public.
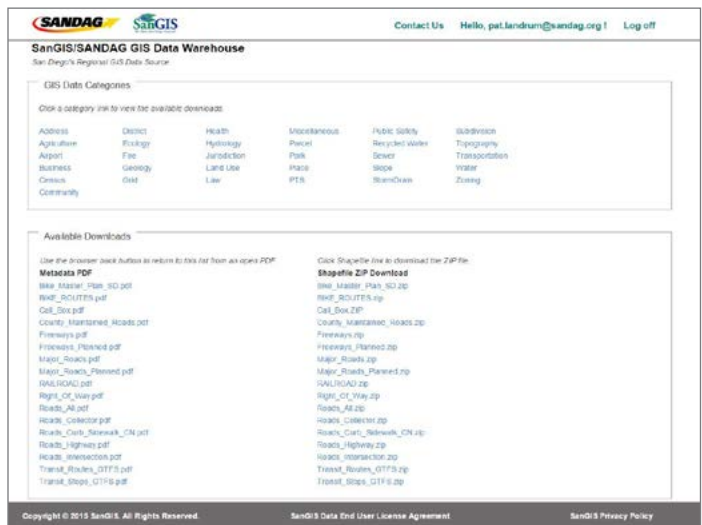
With thirty years of experience, SANDAG provides numerous options available to agencies wanting to establish
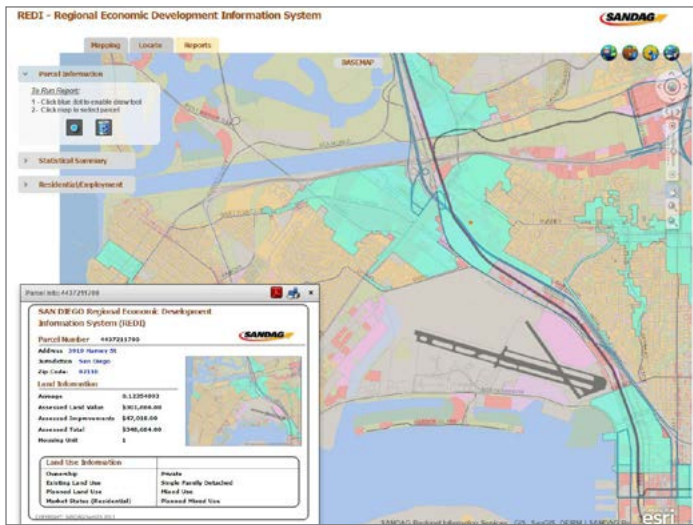
The SANDAG REDI application provides information on land use and land ownership, business incentive areas, and market status.

The Regional GIS Data Warehouse is an open data clearinghouse where users have access to more than 270 GIS layers.

a GIS program. Landrum suggests that before deciding on what options to consider, an agency should establish clear goals and objectives as well as identify how progress is to be measured. Keys to maintaining the program as an authoritative source for GIS data are to establish quality-control practices and procedures, and to develop standards-based metadata. Program members and the agency must be able to stand behind their work.

Landrum also notes that a quality program requires an investment in good people and infrastructure. In particular, the agency should find good leaders within its member agencies, tap into their experience and knowledge, and hire GIS professionals capable of delivering the needed services. Finally, a GIS program needs to be located within an organization where it has some creative freedom and recognition that spurs innovation.

Methodology

The author conducted an interview with SANDAG's chief GIS analyst. A standardized set of interview questions guided the discussion. The author used a conversational interviewing technique to more fully explore the participant's experiences and perceptions of the GIS program. The interview was tape recorded and reviewed in compiling notes for this report. The author sought written permission prior to attributing quotes to the individuals interviewed. The author wishes to thank the SANDAG staff for taking the time to discuss its GIS program. Their contributions to the study were invaluable.

Study Participant

- Pat Landrum, Senior GIS Analyst, San Diego Association of Governments (SANDAG)

About Esri

Esri inspires and enables people to positively impact the future through a deeper, geographic understanding of the changing world around them. Our technology enables organizations to create responsible and sustainable solutions to problems at local and global scales.

At Esri, we believe that geography is at the heart of a more resilient and sustainable future. Governments, industry leaders, academics, and nongovernmental organizations (NGOs) trust us to connect them with the analytic knowledge they need to make these critical decisions that shape the planet.

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About ICMA

ICMA, the International City/County Management Association, advances professional local government worldwide. The organization's mission is to create excellence in local governance by developing and fostering professional management to build better communities.

ICMA identifies leading practices to address the needs of local governments and professionals serving communities globally. We provide services, research, publications, data and information, peer and results-oriented assistance, and training and professional development to thousands of city, town, and county leaders and other individuals and organizations throughout the world. The management decisions made by ICMA's members affect millions of people living in thousands of communities, ranging in size from small towns to large metropolitan areas.

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