Esri SMART COMMUNITIES

F.T. LAUDERDALE

DEVELOPING A RESILIENT, SMART CITY

Fort Lauderdale, Florida

Noa Gutterman, Assistant Project Manager, ICMA

esri   ICMA

> **Community resiliency refers to the ability of a community to plan for, prepare for, and recover from man-made and environmental disasters.**

COMMUNITY PROFILE:
Fort Lauderdale, Florida

Population Size: 176,013 (2014 US Census estimate)

GIS Program: Centralized

Number of Departments Using GIS: 11

Total FTEs: 6

Core GIS Budget: $800,000

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.

DEVELOPING A RESILIENT, SMART CITY

Fort Lauderdale, Florida

L ike many cities facing both natural and man-made events, Fort Lauderdale continually works to be prepared to deal with both. In its many programs to promote community resiliency, it often uses GIS as a vehicle to explore past disasters, react to ongoing events, and make predictions about the future.

Given that tourism is one of the city's top economic drivers, maintaining Fort Lauderdale's infrastructure and beaches is a chief concern for local officials. Thus, with community resiliency as a primary factor spurring many of its advancements, the city has worked to expand GIS beyond its original application as a traditional mapping tool. As a coastal city, Fort Lauderdale uses GIS technology to analyze and respond to issues such as flooding, hurricanes, and coastal erosion. Applications have been and continue to be developed to plan for contingencies when disasters and emergencies strike.

With a vision for integrating GIS technology in all aspects of local government, Fort Lauderdale hired its first GIS coordinator in 1998. In 1999, city officials set the wheels in motion for the citywide adoption of GIS technology. The power of this technology would enable Fort Lauderdale to proactively address the demands of its citizens and its environment. City officials saw the benefits of using GIS to inventory and manage utility infrastructure, especially utilities such as pipes that were first installed in the 1960s. They worked with Florida Atlantic University's Planning Department to launch the city's GIS program, thereby allowing local students to participate in the program's creation and learn about the application of GIS in their community.

Since its inception, the GIS program has grown to a staff of six full-time equivalents (FTEs) forming a division within the Information Technology (IT) Services Department. Under the leadership of City Manager Lee Feldman, Chief Technology

Officer Mike Maier, and GIS Manager Ian Wint, members of Fort Lauderdale's GIS staff have developed GIS applications to inventory utility assets and manage these assets in a digital format. "We're looking to integrate GIS to the extent we can in our day-to-day operations. In today's technology world, platforms like GIS make our jobs easier," says Maier.

GIS for Community Resiliency

Specifically, the city has worked to develop GIS tools to predict and map potential environmental disasters; it also works to incorporate GIS technology into its permitting processes, land issues, flooding issues, and storm issues, among others. "If we break out into emergency mode, GIS is one of our most important tools," says Maier.

311/CRM Systems. GIS is used in the management of a centralized customer service system, also known as a 311/Customer Relationship Management (CRM) system. Having a 311/CRM system in place helps local governments offload nonemergency calls from citizens during a disaster so that public safety personnel can focus on life-threatening concerns. By facilitating open communications between a city or county and its citizens, a 311/CRM system enables citizens to share pertinent information with their local governments, which can, in turn, share instructions on how to safely deal with nonemergency situations.

Although Fort Lauderdale falls within Broward County's regional 311/CRM system, the city has developed its own 311/CRM system, QAlert™. Through this system, citizens can alert the city about problems such as damage from hurricanes or floods, and the city can manage the entire citizen request process, from notification to completion, entirely online.

Stormwater Master Plan Project. Fort Lauderdale also promotes community resiliency through its Stormwater Master Plan Project. To ensure that the city meets the stormwater reporting benchmarks required by the Environmental Protection Agency's National Pollutant Discharge Elimination System (NPDES) program, Fort Lauderdale has developed the Stormwater Operations Program (SWOPS), which integrates GIS technology to save time and money. As part of this program, teams investigate and catalog each stormwater asset within the city twice a year. Before the GIS-based system was implemented, field inspections information was handwritten in the field on paper maps; clerks had to be borrowed from other departments to complete data entry, a process that took two clerks over four months a year. Now, with the use of

ArcGIS for Collector on iPads to catalog and manage assets, each stormwater asset inspector inspects his or her designated assets to determine whether they are operable or require any repairs. The elimination of data entry from the workload of the borrowed clerks has allowed these individuals to return to their core activities and focus additional energy on the development and management of Fort Lauderdale's purchase card program to ensure that all purchases made on behalf of the city are accounted for and billed correctly.

FEMA National Flood Insurance Program. In a similar effort to streamline processes and increase savings, Fort Lauderdale participates in FEMA's National Flood Insurance Program. Local governments can apply to this program to lower their "Community Rating" scores and thereby save their constituents money on their flood insurance premiums. Fort Lauderdale uses GIS to analyze flood-zone areas and create an interactive web-based application that allows constituents to access flood designation zones for all areas of the city. The rating Fort Lauderdale received has saved constituents millions of dollars since the city joined the program.

Mapping flood zones helps the city determine where resources should be targeted during storms.

Evacuation Routes. Using GIS, Fort Lauderdale has created maps that identify and highlight all possible evacuation routes in case of flooding so that citizens can be prepared for emergency situations. The maps also provide decision makers, first responders, and emergency crews with a better understanding of where they should concentrate their efforts in an emergency situation and how they can ensure the safety of citizens in every part of the city.

Coastal Erosion. As has been noted, tourism is a major industry in Fort Lauderdale, and most tourists come to enjoy the city's many beaches. As a result, city officials need to stay on top of any and all beach erosion. The city has used GIS to take aerial photographs of the coastline to track erosion on a year-to-year basis. Staff then use GIS to analyze the data and convey patterns and trends in erosion to decision makers and policy makers. The visual data obtained from the yearly analyses of the aerial photographs provide concrete evidence of the increasing erosion and help the city undertake measures to safeguard its beachfront and, in turn, its tourism industry.

Demand for Data

With the integration of GIS technology into a diverse range of software programs, GIS touches nearly all city departments and staff. Departments such as Public Works and Utilities, which have successfully integrated the technology into their programs since 2001, are making significant developments in their practice and application of GIS. For example, the Public Works Department recently used GIS to complete a sidewalk survey mapping all cracked or damaged sidewalks in the city. The increasing number of GIS-proficient staff in all departments helps to open the process of GIS application creation and design to almost every city staff member.
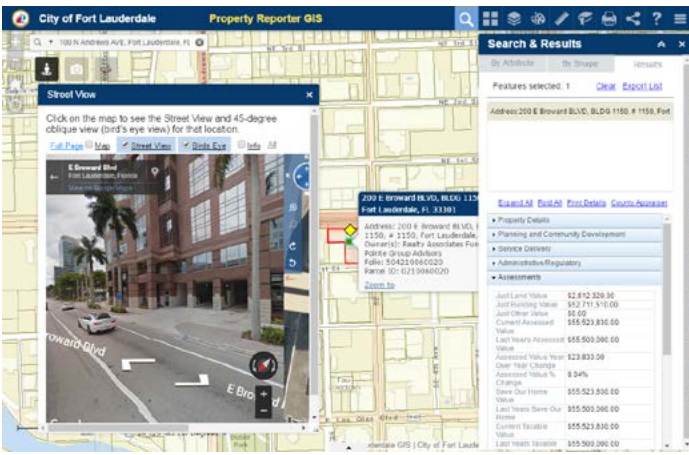

As a coastal community, Fort Lauderdale places a high priority on the protection of its waterfront and beaches.

Several of the city's GIS applications were built from Esri templates—most notably, ArcGIS for Local Government Maps and Apps (**http://arcg.is/1Xdt1WI**) and Web AppBuilder (**http://arcg.is/1TiGbPM**). Many of these templates can be modified with little or no programming effort to fulfill a city need; for example, Fort Lauderdale used the ArcGIS for Local Government Park Locator app template (**http://arcg.is/1Yu2aV7**) for Park and Recreation Finder to create a new and improved version of its Park Finder application. The city was able to adapt these templates to fit its needs by adding an additional search feature that allows users to specify their unique search locations. By making such modifications rather than building a completely new application, the city estimates a savings of over 200 hours for the Park Finder app alone.

Neighborhood Engagement

Since Fort Lauderdale first implemented GIS technology, city officials have tried to get the technology into as many hands as possible in order to answer constituents' questions before they are even asked. Although the city does not use a formal citizen assessment committee when developing GIS applications, the GIS Department staffs

The city's Property Reported app captures data for analysis.

Fort Lauderdale's SWOPS application, which is used to carry out the NPDES stormwater activity mandated by the State Department of Environmental Protection, saves numerous labor hours.

a booth at the city's annual open house, where citizens can offer suggestions and improvements for existing and future GIS applications. Having a strong presence at the event increases the visibility of GIS programs and applications in the community. It also serves to garner consistent feedback from constituents and to promote new technologies to a wide and diverse audience.

The city of Fort Lauderdale hosts an annual event called Neighbor Support Night. This event allows city departments and officials to strengthen ties with their constituents and build public awareness of relevant issues. This

is especially important for building relationships among individuals, as citizens generally need to be prepared to take care of themselves and their neighbors for up to seventy-two hours during an emergency or crisis. The IT Services Department, which houses the GIS division, has played a major role in this event by showcasing new GIS applications each year. Attendees of the event are able to explore past, present, and future GIS applications on computers, tablets, and mobile phones, and GIS staff are available to help demonstrate these applications and answer any relevant questions.
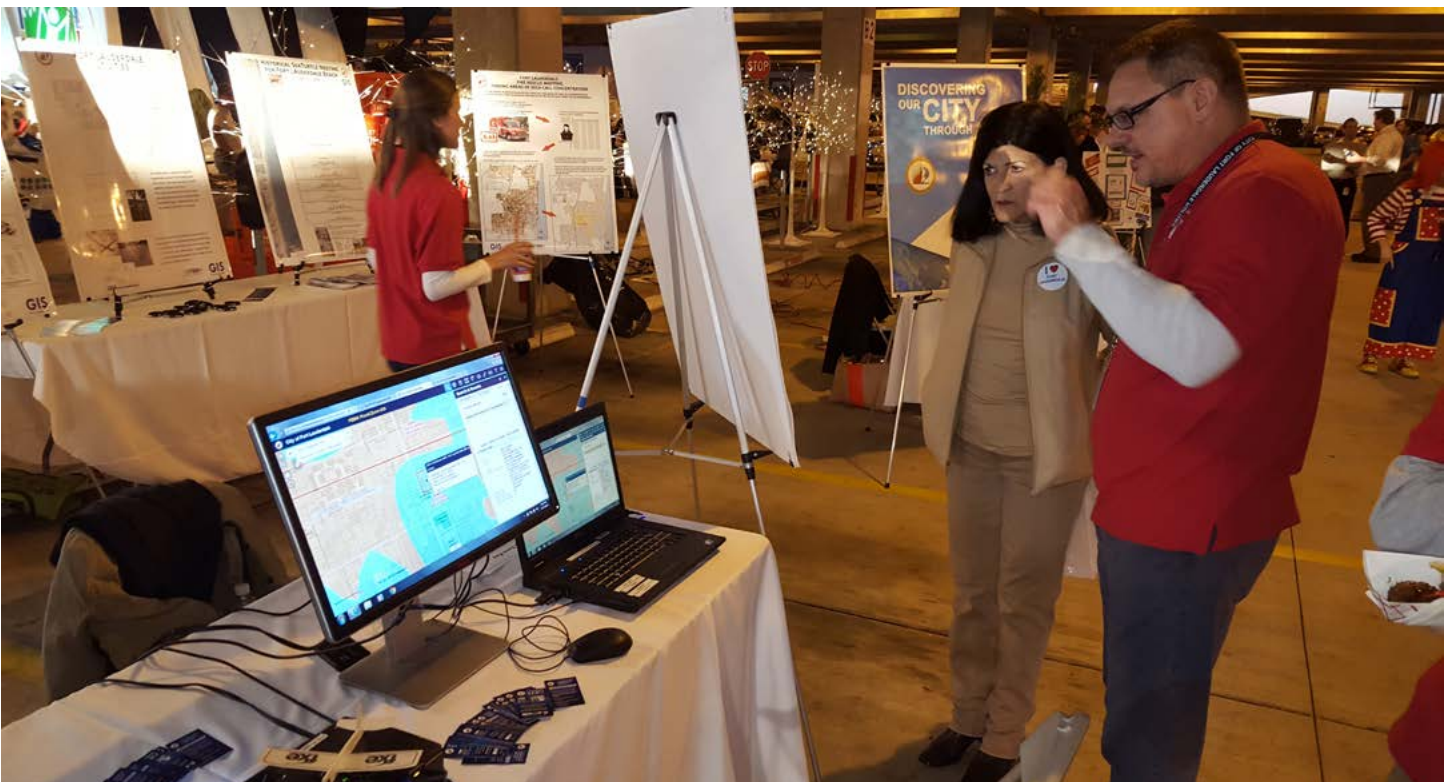
The city of Fort Lauderdale uses maps to engage neighborhoods in planning for community resilience.

> **"We're in an area that's susceptible to tropical storms and sea level rise. From a geography standpoint, understanding and promoting community resiliency is one of our main objectives."**
>
> **—Lee Feldman, city manager**

Plans for the Future

All these achievements notwithstanding, the city continues to look ahead. Enterprise resource planning (ERP) systems allow cities to use their resources more effectively by streamlining processes, consolidating various components of each department, and allocating budgets. Fort Lauderdale officials are planning to develop an ERP system that meets the city's needs—specifically, one that can interface with existing and future GIS technology and applications.

Several new GIS applications are in development as well, such as a road closure application that will allow users to identify all road closures and traffic flow in real time. The city plans to release a GIS-based tool for citizens to map crimes within their neighborhoods. Another new initiative on the horizon is called Geodesign, which will explore the use of Esri's products, mainly City Engine, to visualize the effects of planning policies on the urban environment. The tool will address requests such as "show me a 3D rendering of the downtown area if we changed the zoning code to allow buildings of over 700 feet in height." It will then show vistas from different areas in the city with the requested potential zoning code change.

These upcoming GIS applications and initiatives only scratch the surface of what city officials have planned for Fort Lauderdale. "GIS seems to consistently grow as we put more applications out there and demand continues to grow," says Maier.

Study Participants

Lee Feldman, *City Manager*

Mike Maier, *Chief Technology Officer*

Ian Wint, *GIS Manager*

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.

esri.com/smartcommunities

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.

www.icma.org/localgovtechalliance