

## PART 1

# ANALYSIS

**S**UCCESSFUL DATA-DRIVEN POLICING STRATEGY STARTS with good analysis. Law enforcement agencies depend on the work of crime and intelligence analysts to reduce crime, support investigations, improve operations, and make smarter, data-driven decisions. Crime and intelligence analysts use modern GIS mapping and spatial analysis tools to make sense of large amounts of data and deliver analysis results to officers and commanders to make better-informed decisions. Because GIS is easier than ever to use, analysts spend less time preparing data and more time enabling decision-making.

### Manage

To do their work, analysts must access data from agency databases and information systems that house incident, crime, offender, and sensor information, and other types of data. A GIS can act as a system of record for these disparate data sources and help an analyst extract, integrate, and prepare data for analysis. Automating these processes can make data readily available for analysts to spend less time preparing data and more time performing analysis.

### Analyze

Many of the most common types of analysis are spatial, and connecting people, events, and places together temporally and spatially is the basis for solving many types of crimes and criminal associations. Analysts use GIS to map incidents and identify series,

patterns, trends, and hot spots of incidents in support of short- and long-term crime control strategies and to aid investigations by identifying and linking criminal networks and activities. Today's modern GIS technology can do even more, as analysts use advanced techniques such as spatial statistics, machine learning, and 3D models for even deeper understanding of complex patterns and relationships in the data.

## Share

Analysts must get information products out to the rest of their agency. GIS allows them to share analysis quickly and easily using maps, data visualizations, charts, and reports delivered in a variety of formats, including interactive bulletins, web maps, mobile apps, and hard-copy printed documents. From there, the logical next step is providing maps and apps for the end user to do their own analysis and query the data. Creating dashboards for command staff, mobile apps for officers in the field, and public web apps to share information with the community are relatively easy tasks using configurable GIS web apps.

## GIS in action

This section will look at real-life stories about how law enforcement organizations use GIS analysis to gain better insights.



The police department's ITS team, which includes a GIS specialist, systems analyst, and data specialist, along with a team of five analysts in the Intelligence-Led Policing (ILP) unit, set out to address and fix the lack of visual representation. Together, the group administers ArcGIS® technology and creates the maps and dashboards used by more than 575 officers, detectives, and supervisors at the police department. More specifically, the ITS unit manages the department's ArcGIS Enterprise portal, while the ILP unit is a data-driven center that provides support to tactical, strategic, and operational initiatives.

According to Dr. Richard Ferner, Jr., the ILP unit supervisor, several department stakeholders, including the police chief and command staff, were overwhelmed by the sheer volume of text-based information about crime. The police department implemented older types of geospatial technology but lacked the flexibility to support custom, user-friendly visualizations.

“Those solutions did not promote robust and relevant visualizations,” said Ferner. “Users had little incentive to utilize those tools when deliberating on a course of action, such as proactive patrol assignments or developing leads in identifying suspects.” Because of inadequate visualizations, staff and supervisors had difficulty gaining meaningful insights to make decisions and work effectively.

In 2014, the arrival of the new police chief, Anthony Holloway, marked the department's transition to a data-driven organization. Holloway advocated adopting a management model called CompStat, or computer statistics, a policing method that uses timely and accurate information to combat crime efficiently and improve police accountability.

At the time, the ITS team realized it needed to move away from a static environment and deliver content in an interactive manner.

“The minute I heard Esri® developed an enterprise solution that could allow the user community to interact with the content we

publish, I knew, unequivocally, that was the solution we needed,” said Ferner.

In 2016, the department implemented ArcGIS Enterprise and ArcGIS Pro software and has kept pace with each upgrade, steadily adding products such as ArcGIS Insights<sup>SM</sup> and ArcGIS Dashboards.

ArcGIS Enterprise was key in supporting the department’s need for a secure, behind-the-firewall enterprise platform that powered data management and analysis, especially in the context of law enforcement data.

“There’s a level of comfort in knowing that it’s our data on our in-house system and that it’s not located somewhere that we don’t have control over who sees it or what’s being accessed,” said Ullven.

Before implementing ArcGIS Enterprise, department analysts created static content that was distributed through email and posted to a file-sharing system and Microsoft SharePoint. Disparate tables, charts, and graphs did not tell the whole story, and there was no way to customize dashboards to visualize data and come up with a common operating picture.

Using ArcGIS technology, “we can carve out highly nuanced, relevant data that matters and answers questions,” said Ferner. “It helps the staff and supervisors carve out a strategy and set of tactics for immediate application.”

Analysts have created dashboards and stories that focus specifically on what each unit needs to know. That way, people don’t get overwhelmed with irrelevant information.

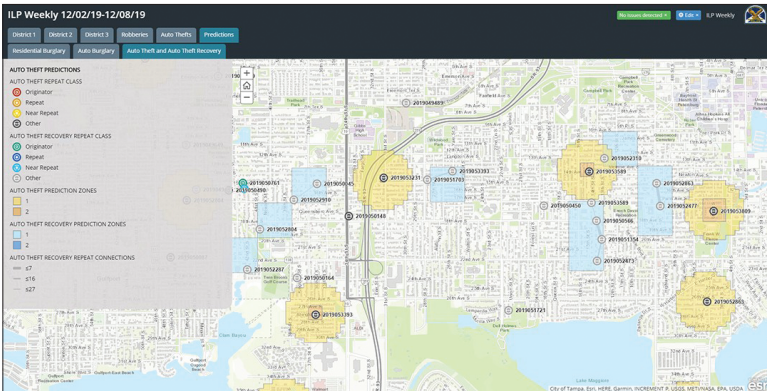
The department also began refreshing the data 45 minutes before each shift, allowing watch commanders to detect emerging crime trends and evaluate initiatives on the go. Analysts use the Crime Analysis configuration in ArcGIS Pro along with Insights to analyze data and then share interactive content via stories and dashboards made using ArcGIS Enterprise.

“Canvassing a neighborhood no longer requires a six-foot-long paper map and tons of hard-to-decipher markings,” said Kevin Christy, the ITS team’s GIS specialist.

Instead, an app created using ArcGIS Web AppBuilder made the process more targeted and efficient by allowing detectives to digitally track the addresses they visit. And ArcGIS Survey123 enhanced the department’s Eagle Eye program, a public camera registration website, making it easier to geocode addresses and maintain an up-to-date camera locator app.

In one example, the command team was looking for information about parking meters being destroyed in downtown St. Petersburg. Analysts pulled crime data for areas around parking meters, used ArcGIS Pro to predict a crime risk area, and published this data on a map in ArcGIS Enterprise. Staff could then use the prediction to plan operations.

The data to make the prediction was acquired from the records management system (RMS), where detailed accounts of crime around each parking meter location were documented. Analysts



then geocoded each parking meter location in ArcGIS Pro and subsequently published the content as a hosted feature layer in ArcGIS Enterprise.

Armed with this analysis, police officers patrolled the risk area identified in the prediction and encountered the suspects, who were arrested as they prepared to commit more crimes. Prior to implementing this vast array of ArcGIS technology, doing this kind of analysis and making such a prediction were not possible.

Now, more officers are requesting specific dashboards from the ILP and ITS units. They want to see what ArcGIS technology can do, and when they get a tour of it, their eyes light up, according to Christy.

“I see their wheels turning,” he said. “The big thing is tailoring it for exactly what the end user wants. Whether it’s ‘I want these metrics in my dashboards’ or ‘I want these colors’ or ‘I want an app that does x, y, z,’ it’s all about giving them what they want. If they don’t get exactly what they want, they’re less likely to use it.”

Ferner also noted that having a growing number of younger police officers has contributed to a critical mass of software users in the department.

“One of our biggest challenges was the cultural dynamic in giving them access to these products and assigning accountability to the metrics,” he said. “The workforce here is also becoming younger, and we’ve discovered that they are more adept with using different technologies. Even if we had a product 10 years ago that is as sophisticated as this one is today, I don’t think the staff then would have been so accepting of these technologies.”

The move from static maps and data that officers couldn’t fully engage with to a more interactive mapping platform has transformed the department.

“Esri allows officers to have a customized product that really presents them with geospatial data that prompts questions,” said Christy. “They can look at the data, they can ask questions, and now they are getting more insights than they had in the past. It’s really helping to drive better policing.”

A version of this story originally appeared in the spring 2020 issue of *ArcNews*.