Location, Location, Location

» Putting your library on the map.*

BY LORI AYRE AND JIM CRANER

Over the past several years, we've witnessed a virtual explosion of geospatial software, services, and tools—that is, software and tools that enable us to easily map people, places, things, and data. Libraries are uniquely poised to take advantage of these new tools to improve operations and decision-making and to engage their patron communities. These software tools are frequently referred to as geographic information systems, or "GIS."

GIS can be (incredibly) oversimplified to the concept of "digital maps." Humans have been using maps for thousands of years—we're "location-aware," to borrow a phrase from the software industry. Maps are a way to visualize data, much like pie charts or bar graphs—but in the case of maps, we're visualizing the physical world around us. And even as libraries deliver more services virtually, they remain physical centers of the neighborhoods and cities they serve. And spatial data can help us learn more about the neighborhoods and cities where our libraries are anchored.

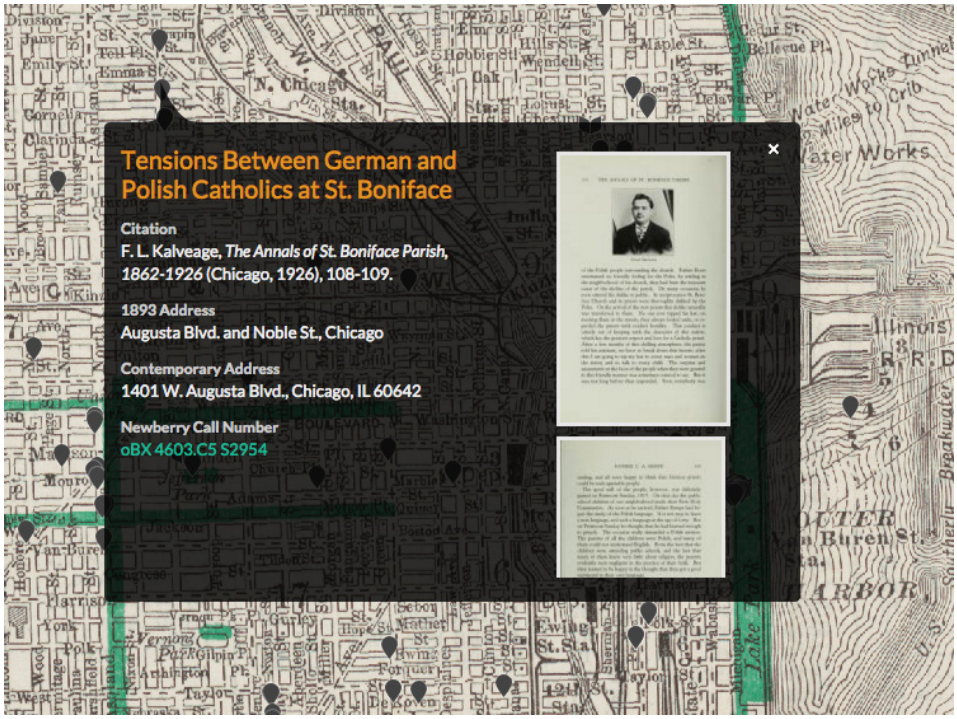
In other words, maps help us learn and share the stories of the community around us. And if there are two things that librarians know, it is stories and their communities.

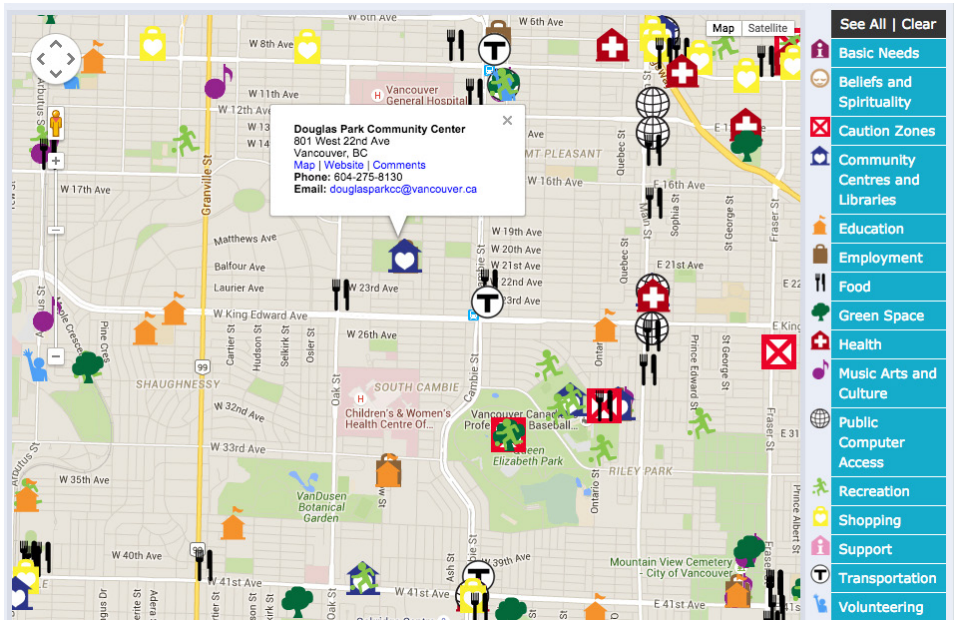
IMPROVE SERVICE DELIVERY AND OPERATIONS

The communities that our libraries serve can change rapidly these days, and so do the needs of our patrons. How do we ensure that we are properly serving these dynamic communities? How can we identify the services that our populations need if we don't really know who they are?

The good news is that tools, data, and expertise are available to help libraries understand more about the people living in the shifting neighborhoods that make up their service areas. Forward-thinking libraries are combining their existing patron data with other data sets to generate custom maps of service areas, patron activity, and more. These maps can be used for specific projects, such as identifying areas of population growth for branch expansion. They can also be used for continuous service improvement by ensuring that collections and services meet the needs of the populations they serve. They provide a place-based context for the decision-making needs of library management and boards.

In 2011, Gina Milsap wrote an excellent article for *InfoToday* describing how the Topeka & Shawnee County Library management used commercial market segmenta-





Top: Historical record displayed on Newberry Library's "Faith in the City" map.
Bottom: Youth Asset map created by youth as part of City of Vancouver's Sustainable Cities Initiative.

tion data and GIS software while formulating the library's strategic plan (http://tscpl.org/wp-content/uploads/2011/08/P.MLS-3368-R.pdf). The article describes how the library and a consulting firm combined data beyond typical demographics –such as detailed marketing profiles of individual neighborhoods—to improve the relevancy of their collections and increase library usage. As a library system serving a diverse population of urban, suburban, and rural communities, this place-based approach to decision making was particularly useful for planning.

Ten years ago, many of these activities were limited to large library systems working with their municipal or county hosts' GIS departments, or those that could afford external consultants specializing in geographic analysis. The consultant mentioned in Milsap's article, Civic Technologies, now has competition from upstarts like Orange Boy and Gale. Esri, the largest and most well-known corporate and government GIS provider, has begun offering geospatial data and tools targeted at libraries.

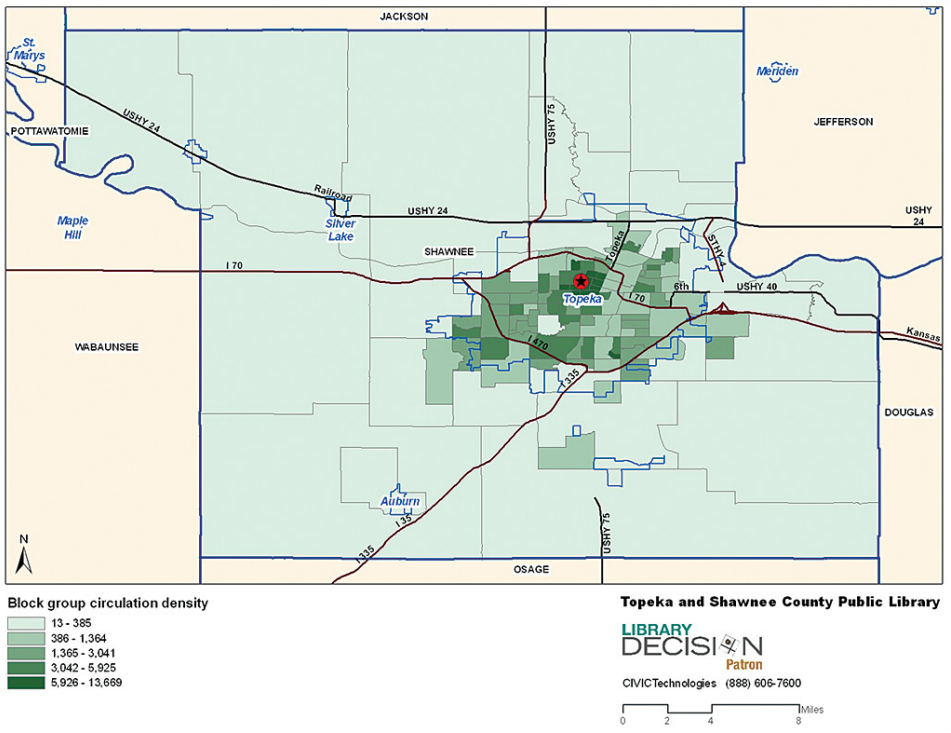
But you don't have to have a GIS department in-house or an expensive consultant on retainer these days. In the past decade, hundreds of open source projects and free online services—many well-suited for entry-level mapping and analysis projects—have become available. From simple mapping solutions like Google "My Maps" (https://www.google.com/mymaps) to complex GIS analytics and visualization tools like QGIS (http://www.qgis.org/) and GRASS (https://grass.osgeo.org/), budding cartographers have no shortage of free options. In addition, a flood of open data sources allow libraries to create data "mash-ups" that would have been unthinkable just a few years ago.

ENGAGE YOUR COMMUNITY

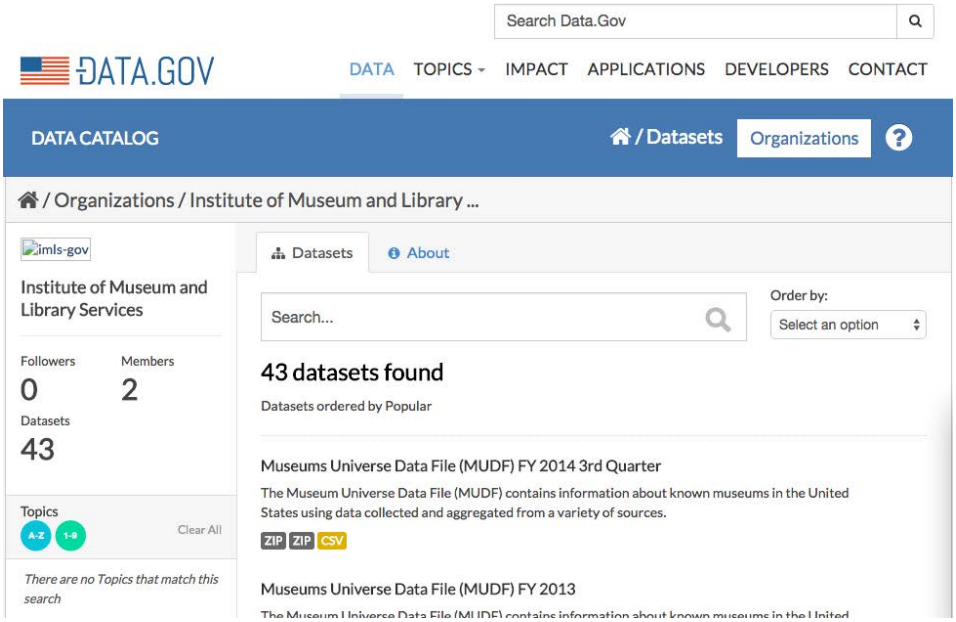
Digital maps and GIS applications can also make compelling tools for engaging patrons and other members of your community. Check out just a few of the many great examples:

- Create a digital "literary map" of your city or region (or participate in your state's literary map). Literary maps are maps of a region with information about the genres, authors, and specific titles associated with that area: think Steinbeck's recurring use of the Monterey, CA area as a setting (http://www.lib.umich.edu/online-exhibits/exhibits/show/litmaps/author/the-john-steinbeck-map-of-amer), or the city of New Orleans appearing in literature from Twain to Eggers (http://dsl.richmond.edu/tocqueville/LiteraryNewOrleans.html). These can be artistic, print-based representations of your region's literature or interactive maps with direct links to titles in your library catalog.
- Engage youth to take "asset mapping" to a new level: everyone views their communities differently and today's teens have a unique perspective. Download some free GPS and mapping software for smartphones and tablets and lead "mapping tours" of your community or neighborhood. From hangouts and hot spots to schools and skate parks -- take a look at this integrated youth mapping program curriculum from Vancouver, BC: http://sustainablecities.net/our-work/sustainability-projects/where-we-work/north-america/item/3-mapped-vancouvers-youth-asset-mapping-project.
- Tell the tale of your city through time:

University of Richmond's Literary New Orleans map.



Topeka/Shawnee County's circulation figures mapped by neighborhood/community area.



Data.gov is the Federal clearinghouse for freely-available statistical and demographic data.

work with your local historians to embed your oral history videos, archives, historical photos, and other records on historical maps. New York Public Library engages volunteers to crowdsource and correct data on historical maps of Manhattan and the outer boroughs (http://buildinginspector.nypl.org/), as well as display the data in new and interesting ways (http://www.nypl.org/blog/2014/05/05/historical-maps-minecraft).

- The Newberry Library in Chicago has created Chicago Ancestors (http://chicagoancestors.org), a site that lets amateur genealogists and historians contribute and search historical sites throughout the city.
- Check out the StoryMap project (and free interactive map-building tool) from Knight Labs for some other great examples: https://storymap.knightlab.com/.

LEVERAGING OPEN DATA TODAY –PROCESS EXAMPLES

Let's look at how a library might put this technology to use. First, the library maps out its active patrons within the community, then "overlays" a census map of income levels. By comparing these data visually, it becomes clear that pockets of low-income areas exist with relatively few library patrons compared to other similar areas of the community.

The library then "overlays" a map of the community's public transit, where analysts see that a lack of reliable public transit in this neighborhood is a contributing factor to the neighborhood's lack of library use. Equipped with this knowledge, the library's management actively takes steps to engage this neighborhood by providing a self-service kiosk, increasing bookmobile coverage in the area, and partnering with neighborhood groups for outreach activities.

More useful examples: perhaps census data indicates that a relatively new immigrant community is growing within your city or county. A prudent step might be to analyze the services and collections of nearby branches to ensure the community is being adequately served. Thinking of seeking grant funding to support services to low-income households in your community? Overlaying your state's free lunch statistical map can illustrate branches and nearby schools especially well-suited to participating in such a program.

These are just a few of the questions that can be answered with geo-aware data, if you are asking the right questions and leverage the available data to provide those answers.

GETTING STARTED: FINDING GEOSPATIAL OPEN DATA

Now that we've learned about the potential benefits and seen some powerful examples of GIS being used by libraries, let's dig in deeper to see what this process can look like. To begin, where on Earth do we find data to put on our map?

The first part of any map is the "base layer," the underlying "surface" of the map, displaying your city or district. If you're working with your city/county government's GIS team, they might provide access to a private online GIS service with relevant local data, such as library branches, city/county boundaries, neighborhood/ward boundaries, and school districts. Working on your own? You'll want to check out the capabilities of various cloud-based mapping systems, such as Google Maps/Earth, Esri's ArcGIS Online, CartoDB, or OpenStreetMap. Many of these services offer their core functionality free of charge.

You've likely already got your core patron data available within your library system, although most of these systems don't yet offer built-in integration with GIS or geospatial analysis tools. You might need to do some "data wrangling," as it's known in the industry, to assemble reports and spreadsheets into a usable set of patron location data.

There are also important precautions to take when assembling patron data, such as ensuring anonymity and privacy; for instance, "fuzzing" addresses to ensure that location data can't be reconstructed into a profile of any identifiable individual. Finally, there are technical steps to prepare this data, such as "geocoding," the process of automatically transforming street addresses

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(e.g., "1060 W. Addison St, Chicago") into usable geospatial coordinates (e.g., "41.947°N, 87.658°E") so they can be integrated into a GIS application. Again, there are a number of free software tools and online services that can handle many of these steps for you.

Now we can add some other useful data from other sources. The rise of the open data movement has led to a flood of publicly-accessible data from all levels of government, corporations, academia, and the nonprofit sector. Libraries are especially well-equipped to access and take advantage of this data for use within their planning processes.

Census data, freely available for download from the US Census Bureau (http://www.census.gov) in common geospatial formats, is one rich resource that provides demographic information such as average income, age, types of housing, education, race, household composition, and much more. Modern census data is anonymized to protect citizen privacy, but neighborhood-level data within your service area can be compiled to provide insights about the people within the communities you serve.

Recently, local, county, and state governments have instituted open data portals that allow you to search for and retrieve only data of a certain type or within a certain geographic area: this data can include transportation information and routes, public health data, educational data. Universities and extension offices can also be valuable sources of spatial-enabled data. In addition, private data broker and marketing companies exist that can provide incredibly detailed information about certain neighborhoods, down to the level of spending habits, favorite TV shows, and other behaviors.

OPEN DATA IS A TWO-WAY STREET

A note about the open data movement: as you work with publicly available data sources online, consider whether your library has any data that could be useful to other organizations. Libraries tasked with storing municipal or local newspaper archives could leverage that role into operating their own local data portals for community-specific data. In addition, libraries can educate patrons on the wealth of available open data that is meaningful to them: school-wide report cards, public safety and crime data, property tax systems, and more. One of this year's most compelling Knight Challenge applicants is working on a pilot project to help libraries in the western United State become data educators: https://www.newschallenge.org/challenge/data/entries/data-equity-for-main-street-bringing-open-data-home-through-local-libraries

THE NEXT STEPS

Interested in learning more? The ALA's "MAGIRT" interest group (Mapping and GIS) provides information for both full-time map librarians and for those just getting started with GIS and online mapping projects: http://magirt.ala.libguides.com/resources. The New York Public Library, also provides a list of helpful resources for learning more about basic GIS concepts: http://www.nypl.org/collections/nypl-recommendations/guides/gis.**

So, before you take another strategic step, consider investing in spatial data. Learn what there is to know about the community around you—and put the needs of your library on the map! ■

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**More information on how the New York Public Library is using data mapping can be found at http://www.slate.com/articles/technology/future_tense/2015/10/how_the_new_york_public_library_is_reinventing_itself_for_the_21st_century.single.html.