

3-D Printers for All in Public Libraries

IT'S A THURSDAY AFTERNOON IN CINCINNATI, and people at the downtown public library are making stuff. In the corner, a \$14,410 Full Spectrum laser cutter and engraver hums away, used to create anything from artworks to humble coasters out of paper, wood, and acrylic. Over by the windows, a MakerBot replicator is buzzing; it's one of the library's four 3-D printers, used to fabricate a range of objects, from toys to a custom bike pedal compatible with shoes designed for a patron with a physical disability. Nearby, a young designer is producing a full-color vinyl sign with a professional-grade Roland VersaCAMM VS-300i large-format printer and cutter. "This is our workhouse," my tour guide Ella Mulford, the library's TechCenter/MakerSpace team leader, says of the \$17,769 machine. Most of us couldn't afford such a pricey piece of equipment, but apparently plenty of Cincinnatians can think of useful things to do with it: it runs practically nonstop during library hours, Mulford explains, and is usually booked out for two weeks in advance.

menting with technology as a new component of what they might offer the public. "And part of our strategic plan," Fender continues, "was to introduce new technologies to our community. So we were actively exploring: What does that mean when we say that? What does it look like?" Adding a 3-D printer to the library's existing computer center served as a low-risk experiment—and attracted the attention of every TV station in town. "There was just all this conversation," Fender recalls. "So we thought, 'Hm, this is getting us toward our goal.'"

Enrique R. Silva, research fellow and senior research associate at the Lincoln Institute of Land Policy, points out that there's no real reason to yoke the fate of the library as civic infrastructure to the fate of the physical book. "It's a community space for learning," he suggests. A 2015 Pew Research Center study indicates that the public agrees: While it found signs that Americans have visited libraries somewhat less frequently in recent years, it also concludes that many embrace the idea of new educational offerings in this specific context—tech included. "It's not a difficult leap to make," Silva says.

Indeed, making that leap both extends and updates the role that libraries have long played in many U.S. city and town plans. One of the breakthrough developments in that history was the explosion of such institutions funded by Andrew Carnegie in the decades before and after the turn of the 20th century. Fanning out from Pennsylvania, nearly 1,700 so-called Carnegie Libraries were built in Beaux-Arts, Italian Renaissance, or other classic styles—an effort that both played into and fueled an even wider library-building movement that placed significant landmarks in municipal centers from coast to coast. While remarkable, this ubiquitous element of civic infrastructure often goes overlooked today.

"In modern-day planning," Silva observes, "I think libraries are largely seen as: You're lucky if you have it as an asset, part of the bones of a city that you work around." In the United States, at least, architecturally significant new library

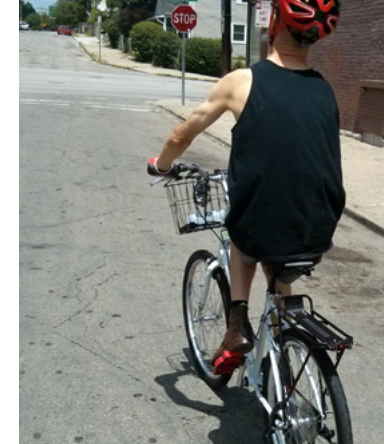
construction is rare (the Seattle Public Library Central Library, opened in 2004 and designed by Rem Koolhaas and Joshua Prince-Ramus, is a notable exception). So libraries tend to be planned around, as an "inherited" element of "social-civic infrastructure," as Silva puts it. A 2013 report from the Center for an Urban Future, focused on New York City, argued that libraries have been "undervalued" in most "policy and planning discussions about the future of the city."

But maybe this oversight implies an opportunity: These existing structures can take on fresh roles that make them newly relevant to ever-evolving municipal plans. The Cincinnati library's rethink of what it means to be a community center of learning and information-sharing is one example. As with the Carnegie Libraries, smart use of philanthropic resources played a role: Fender says the library had a \$150,000 discretionary bequest that it decided to direct to the MakerSpace. To make room, it reorganized its periodicals collection.

The library then took an adventurous view of what kind of technologies it could offer. There's a mini recording studio with pro-quality microphones, used by aspiring podcasters and DJs; photography and video equipment; and a popular "media conversion station" for digitizing VHS tapes and the like. There are also more analog offerings such as sewing machines and a surprisingly popular set of button-making machines. During my tour, I met a charming man named Donny—well known to the library staff—making football-themed buttons. "What's the word, 'entrepreneur'? That's what they tell me I am," he explained.

Turns out lots of entrepreneurial types, from aspiring startup-founders to Etsy sellers, make use of the library's offerings. There are collaborative computer workstations, connected by Wi-Fi and used by everyone from designers working with clients to students teaming up on class projects.

And there's a broader trend here. The Chattanooga Public Library has converted what used to be the equivalent of attic space into a maker center and public tech lab called 4th Floor, regularly hosting related public events. The Sacramento Public Library's "Library of Things"



Ken Oster used the Cincinnati public library's 3-D printer to create a custom bike pedal compatible with special shoes he wears because of a physical disability. Credit: The Public Library of Cincinnati and Hamilton County.

allows people to check out GoPro cameras and tablet devices, among other tech tools. Other experiments abound from Boston to St. Louis to Washington, DC, to Chicago: according to one survey, more than 100 libraries had added some variety of makerspace as of 2014; another report said more than 250 have at least a 3-D printer available.

And the progressive thinking and creativity of libraries align with the goals of many planners: maintaining and exploiting community touchpoints, often embedded deep into crucially central public spaces, and expanding the range of citizens drawn to them. Interestingly, some urban thinkers have begun to explore the potential of makerspaces arising either from the private sector or the grass roots as a component of "a new civic infrastructure." Perhaps libraries like Cincinnati's are already building that.

One challenge, Fender says, is the lack of widely accepted metrics for gauging the impact on a given institution—or, by extension, its civic environment. So Cincinnati has been keeping its own numbers: in September 2015, the MakerSpace took 1,592 equipment reservations, including 92 for the MakerBot, 157 for the laser engraver, and 298 for the vinyl printer. All reflect steady or growing interest. (Thus the MakerSpace collection is growing, with the addition of an Espresso Book Machine that prints volumes on demand.)

"The MakerSpace reminds people the library is there," Fender says, "but it also causes them to look at it in a different way and say: 'Oh, they're thinking about the future, about what the community needs are, and how they can provide something more than the books on the shelf.'" □

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The Public Library of Cincinnati and Hamilton County still offers plenty of books and other media for borrowing and browsing. But its roomy MakerSpace section, opened at the start of 2015 and packed with free-to-use tech tools, is an impressive example of how the library idea is adjusting to a digital era that has not always been kind to books. More to the point, it hints at an evolving role for libraries in cities large and small—contributing in new ways to the municipal fabric they have long been a part of.

In Cincinnati, the process that led to the MakerSpace started a couple of years ago, says Kimber L. Fender, the library's director. A smattering of libraries across the country were experi-