STEAM Spaces at the Main Library

STEAM at the Library will involve **programs in all seven Cambridge Public Library locations**. Everyone in our community will have access to quality Science, Technology, Engineering, Arts & Math programming close to their homes.

Some STEAM activities will require **specialized equipment and more room**. We are re-configuring three areas in the Main Library at 449 Broadway to support such activities:

- A new STEAM creativity zone (provisionally called **The Garage**) will be housed in the lower level of the Main Library. The Garage will consist of a hands-on workshop (aka "makerspace") stocked with digital and traditional fabrication tools, multimedia recording studios for creating audio and video content, and a 3D Motion Lab for experiencing and experimenting with virtual and alternate reality.

- We will also overhaul our main public computing area on the first floor, the Information Commons, which will evolve from a mostly fixed-position computing model to a laptop-focused **Tech Bar**. Library users will be able to take library laptops and other devices (including STEAM learning kits) anywhere in the library (and some even beyond), giving them more freedom and greater equitability with patrons who bring their own personal devices.

- We will also repurpose part of the public computing area as a **STEAM Learning Lab**.

Keep reading to find out how we imagine these spaces will look and the kinds of activities and experiences they will support.

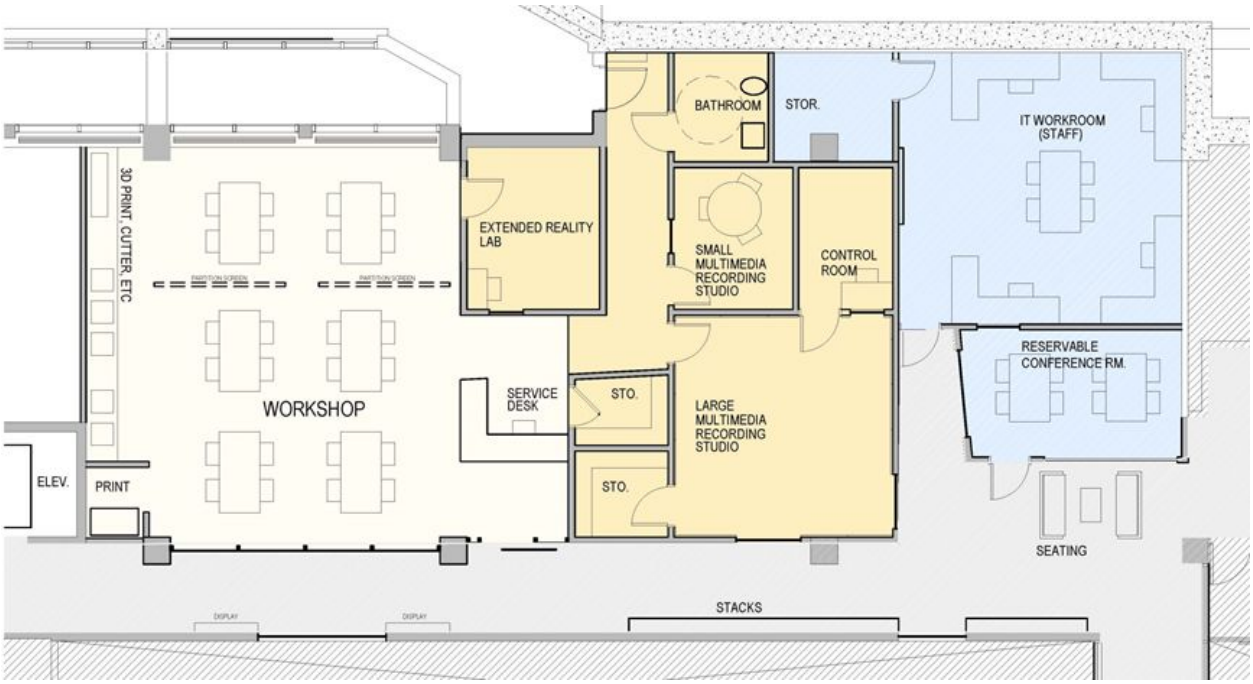
We are working in close consultation with the city's STEAM Advisory Committee, Human Services, Cambridge Public Schools and community partners (such as Google, Edgerton Center (MIT), the Cambridge Arts Council, CCTV) and are actively seeking public input. Please contact us or come to a public meeting if you have questions or ideas!

CAMBRIDGE PUBLIC LIBRARY

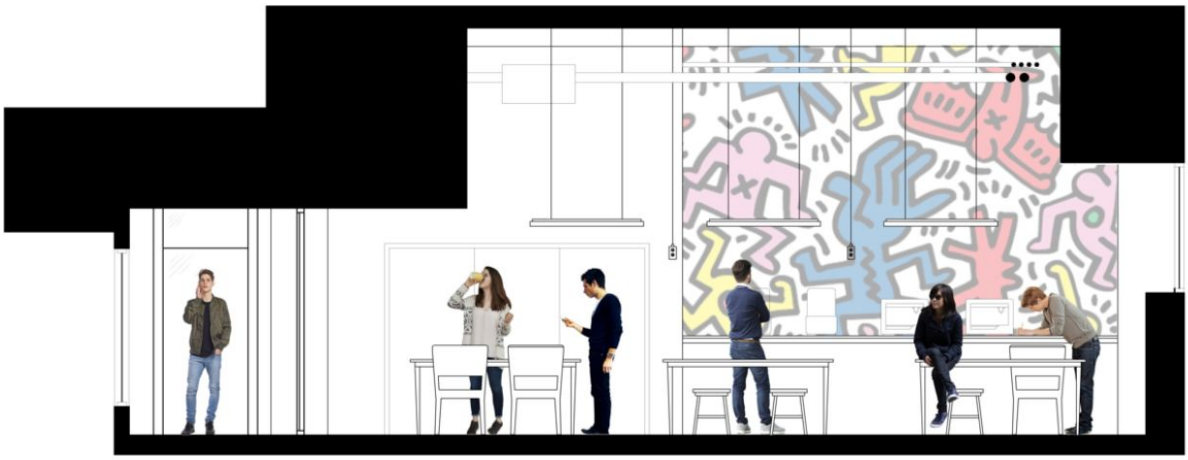
“The Garage”

The Garage will consist of three distinct sections: a large, open **Workshop** for teaching and tinkering, soundproof **Multimedia Studios** for audio and video recording, and an **Extended Reality Lab** for experiencing and experimenting with virtual, augmented and mixed reality. Its focus will be on creating real and digital objects and learning by doing.

All of these spaces and their resources will be used for programmed instruction and activities, led by library staff, volunteers, and outside partners. They will also be available to the public for self-directed learning and making though private bookings and walk-in “open houses.”



The **Workshop** will consist of an open area in which movable tables and chairs can be arranged to support hands-on teaching activities and either collaborative or independent tinkering when such activities are not in session. The periphery will be lined with digital fabrication tools such as 3D printers, laser/vinyl cutters and CNC router.



Besides digital fabrication, the workshop will support physical computing (coding real-world objects such as arduino kits and robots), electronics, and non-digital making such as sewing and handcrafts.

The HATCH at the Watertown Public Library provides many similar services and we hope our Garage Workshop will be similarly successful. Other models we are studying include the pioneering makerspaces of the Chattanooga Public Library 4th Floor, the Fayetteville Free Library Fab Lab and the Rhode Island School of Design's RISD Co-Works. (Please see Appendix for a full list of spaces researched.)

The **Multimedia Recording Studios** will consist of two separate soundproof studios. One studio will support audio recording for 1-2 people: podcasts, audiobook recording, interviews. A larger studio (with attached control room) will support video recording (such as youtube videos) and audio recording (including music) for larger groups.

Image: Creative Commons Zero, Max Pixel

Cambridge Community Television (CCTV) is already a close partner of the library. The multimedia recording studios in the Garage will make this collaboration even more fruitful, allowing CCTV instructors to teach more in depth at the library than they currently can.

We are also in close touch with the Cambridge Public Schools, including the Media Arts Studio. An important goal of our multimedia studios is to allow students to continue working on school projects when school is closed.

In terms of direct patron access (i.e. the public booking these rooms for their own projects), the Vancouver Public Library Inspiration Lab has recording studios that have become one of the models for our multimedia efforts.

The **Extended Reality Lab** (XR Lab) is a dedicated room for the exploding fields of virtual, augmented and mixed reality, collectively referred to as extended reality or XR. A variety of high-powered XR headsets and 3D recording devices will be available, as well as a large screen for mirroring what participants are seeing to instructors and observers. Patrons and students will not only be exposed to these emerging technologies, but learn how to actively create content for them.

As William Gibson famously observed, “The future is already here — it's just not very evenly distributed.” This is particularly true with XR Technologies, which are already quite advanced

and having a significant impact on some segments of society, while others are still largely unaware of them.

In addition to providing exposure to XR and its tremendous promise, the library can play an important civic role in educating the public about potential pitfalls and abuses, such as the use of augmented reality in surveillance, and the addictive risks of immersive virtual reality.

The Reality Room at the Microsoft Garage is an important inspiration for our XR Lab.

The “Garage?”

Our initial name for this space was “The Garage” to channel the entrepreneurial and inventive spirit of that proverbial engine of American innovation, the Silicon Valley Garage. We want to extend that same kind of opportunity for creative, collaborative tinkering to residents of Cambridge, who may not even have a car, much less a garage.

But we are concerned that this name will result in confusion with our parking garage. We would also like to find a name that reflects the diversity of Cambridge as part of its identity and image.

So if you have an idea for a name for this space, please let us know!

The Tech Bar

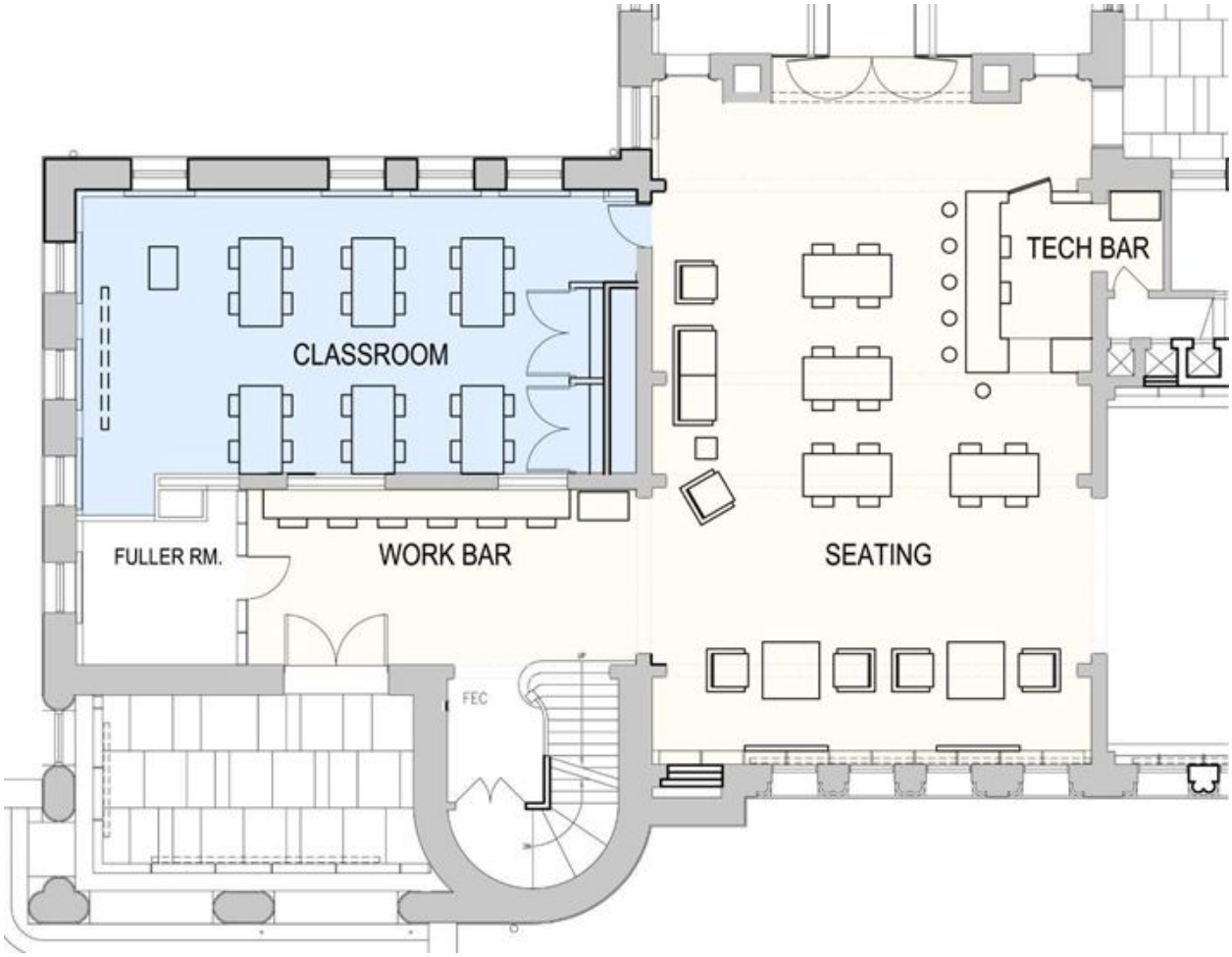
The Tech Bar will be half device checkout station, half technology advice center.

Patrons will walk up to an attractive service bar, staffed by friendly and knowledgeable library staff, where they can check out laptops, tablets, mobile hotspots and other devices, and get help with technology-related questions.

Digital screens will display continually-updated menus of available items, one for in-library use, another for checkout, and a third for services and events. Devices will include laptops, tablets, e-readers, adapters, chargers, media players, microphones, cameras, STEAM-related tools and learning kits, mobile wireless hotspots and more.

The area around the Tech Bar will be optimized for a comfortable portable computing experience, with relaxed coffee-bar inspired furniture and a new “work bar” seating section along the currently unutilized hallway outside the Rindge Room.

Patrons will be able to to take Tech Bar devices anywhere in the library (and some even beyond), putting them on an equal footing with patrons who have and bring their own.



We have been piloting this on a small scale: patrons can currently check out some laptops, chargers and some other devices from the laptop kiosk at the Main Library and services desks at all locations.

The Tech Bar will allow us to take this proven model and scale it up to a far greater number and variety of devices, refresh our offerings frequently and transparently (people expect menus to change!), be the obvious first stop for patron technology questions and needs, and provide a familiar and appealing customer service experience.

The STEAM Learning Lab

By distributing technology use throughout the library and beyond, the Tech Bar will also free up an entire room (called the Information Commons “classroom,” but currently used mostly for peak-load public computing) for use as a flexible STEAM Learning Lab.

Currently this room is filled with fixed-position computers on immovable tables. We will replace these with laptops and flexible furniture to support activities that require different types of computers (mac os, chrome os, windows) or no computers at all.

We will also install state-of-the-art classroom-scale web conferencing hardware and software, allowing instructors and peer classrooms from around the globe to virtually lead or participate in learning activities.

In addition to library-run courses, we are already in discussions with partners who will teach classes and facilitate activities in this space, including Innovators for Purpose, the Harvard Smithsonian Center for Astrophysics, MIT Media Lab and the Public Library Innovation Exchange (PLIX).

In the past year, the CPL has developed successful programming partnerships with local technology- based enterprises and other partners committed to promoting STEAM learning among under-represented youth. InnovatorsforPurpose (IFP) partnered with librarians to offer the Wayfinders Program – a six-week intensive learning camp for rising seventh to tenth graders – where participants learned modeling concepts and techniques, and enjoyed hands-on experiences with 3-D printing, 3-D scanning, virtual reality, and augmented reality. Teens were motivated, focused and excited to participate.

We are also participating in a PLIX Space Initiative with MIT and Harvard to help adapt curriculum materials for a public library setting to bring concepts and learning about satellites and space to our Cambridge youth. Currently, the CPL's Head of Youth Services and Head of Innovation and Technology are following a CubeSats build that local high school students are completing. They will bring this learning to library patrons.

The CPL will continue to explore partnerships for the STEAM at the Library initiative throughout the launch year.

Why Offer STEAM at the Library?

Cambridge boasts some of the world's most prestigious institutions and corporations in the fields of science and technology, such as MIT, Harvard, Novartis, BioGen, Genzyme, Akamai, Microsoft and Google. Despite this, 10th grade MCAS scores show that more than 20% of our students are not yet proficient in math, science, technology and engineering. Furthermore the STEM workforce in Cambridge (excluding healthcare) is predominately white and male -- a poor reflection of the City's diverse population.

The citywide STEAM initiative in partnership with Human Services and CPSD, with the Library as its new hub, is working to establish a network of high-quality learning opportunities for all

residents to gain skills in science, technology, engineering, arts, and math and to expose them to STEAM-related careers. It aims to connect residents from diverse backgrounds with STEAM concepts, careers and role models.

The Cambridge Public Library is a natural hub for STEAM. It is free and welcoming to all. It works closely with the schools, but is open more hours, and serves other ages and populations. Beyond classes and structured activities, the Library offers resources and support for a lifetime of self-directed learning. CPL is an inviting, trusted on-ramp to STEAM learning to all residents throughout the City.

Want More Information?

If you want to learn more about the STEAM at the Library initiative, visit our website.

Appendix

ON-SITE RESEARCH

The Hatch (Watertown Library)
Boston Public Library Teen Room
Goodnow Library (Sudbury, MA)
Snell Library (Northeastern University)
RISD Co-Works (Rhode Island School of Design)
Microsoft Garage
CPSD Media Arts Studio
Makerspace at Putnam Avenue Upper School
Workbar (Co-working Space in Central Square)
Artisan's Asylum (Community Workshop, Somerville)
Meadowbrook School
CCTV

VIRTUAL RESEARCH

The DO SPACE (Omaha, NE)
The Idea Lab (Denver Public Library, CO)
The Digital Studio (Lexington Public Library, KY)
The Info Commons (Brooklyn Public Library, NY)
Vancouver Public Library Inspiration Lab (Vancouver, Canada)
Fayetteville Free Library Makerspaces (Fayetteville, NY)
Chattanooga Public Library 4th Floor (Chattanooga, TN)
The Mix at San Francisco Public Library (San Francisco, CA)
Orange County Library System (Florida)

Date: July 19, 2018