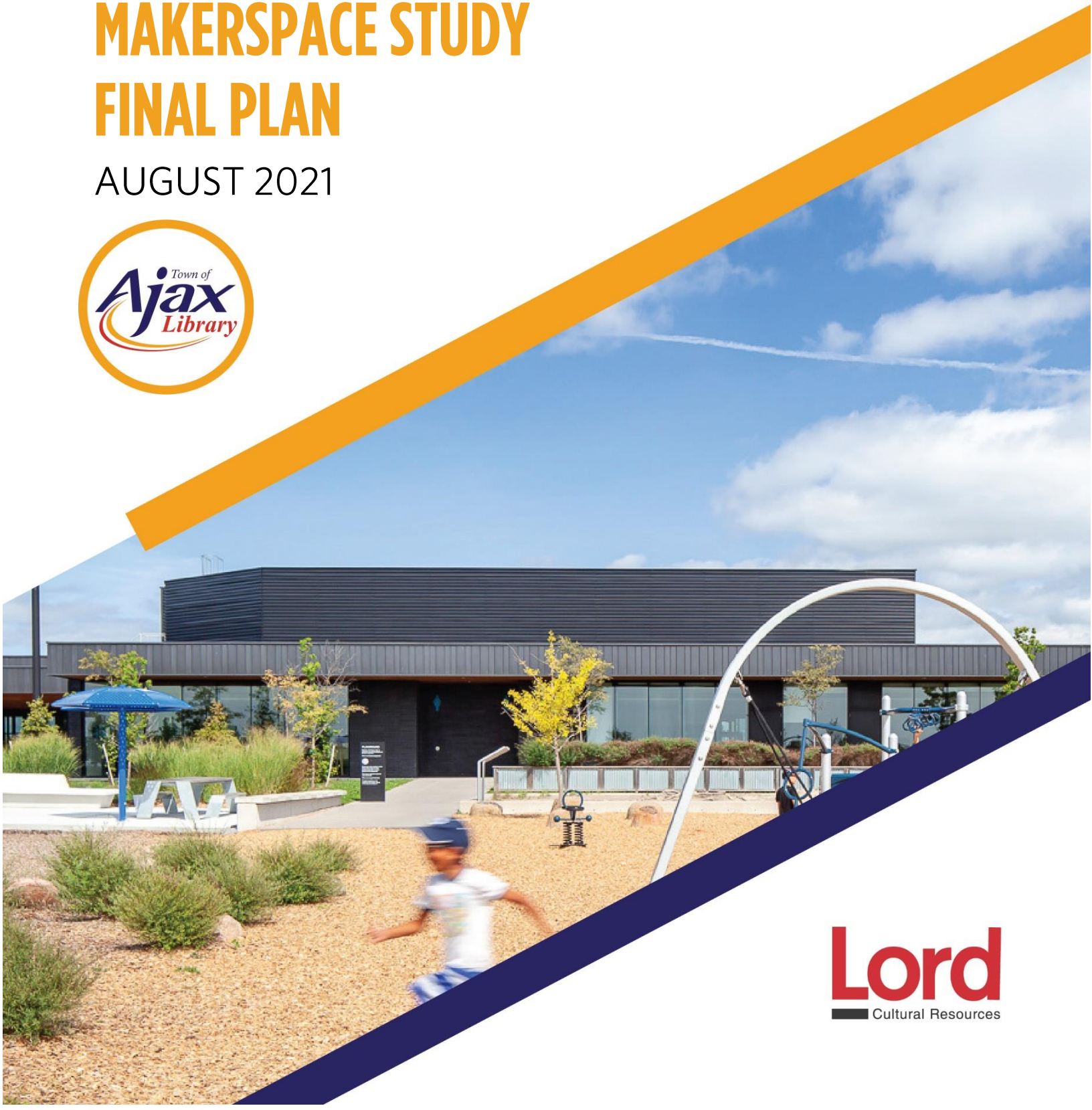
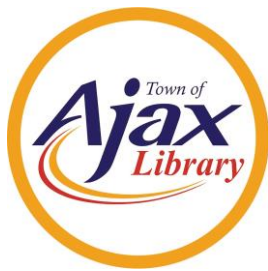


# AJAX PUBLIC LIBRARY

## MAKERSPACE STUDY

## FINAL PLAN

AUGUST 2021



Lord Cultural Resources is a global professional practice dedicated to creating cultural capital worldwide.

We assist people, communities and organizations to realize and enhance cultural meaning and expression.

We distinguish ourselves through a comprehensive and integrated full-service offering built on a foundation of key competencies: visioning, planning and implementation.

We value and believe in cultural expression as essential for all people. We conduct ourselves with respect for collaboration, local adaptation and cultural diversity, embodying the highest standards of integrity, ethics and professional practice.

We help clients clarify their goals; we provide them with the tools to achieve those goals; and we leave a legacy as a result of training and collaboration.

Our Toronto office is located within the traditional territory of many nations, including the Mississaugas of the Credit, the Anishnabeg, the Chippewa, the Haudenosaunee and the Wendat peoples. Our New York office is located on the traditional lands of the Lenape peoples. Our Long Beach office is located on the land of the Tongva/Gabrieleño and the Acjachemen/Juaneño Nations, who have lived and continue to live here. We encourage you to acknowledge the presence of the people who came before, wherever you are.

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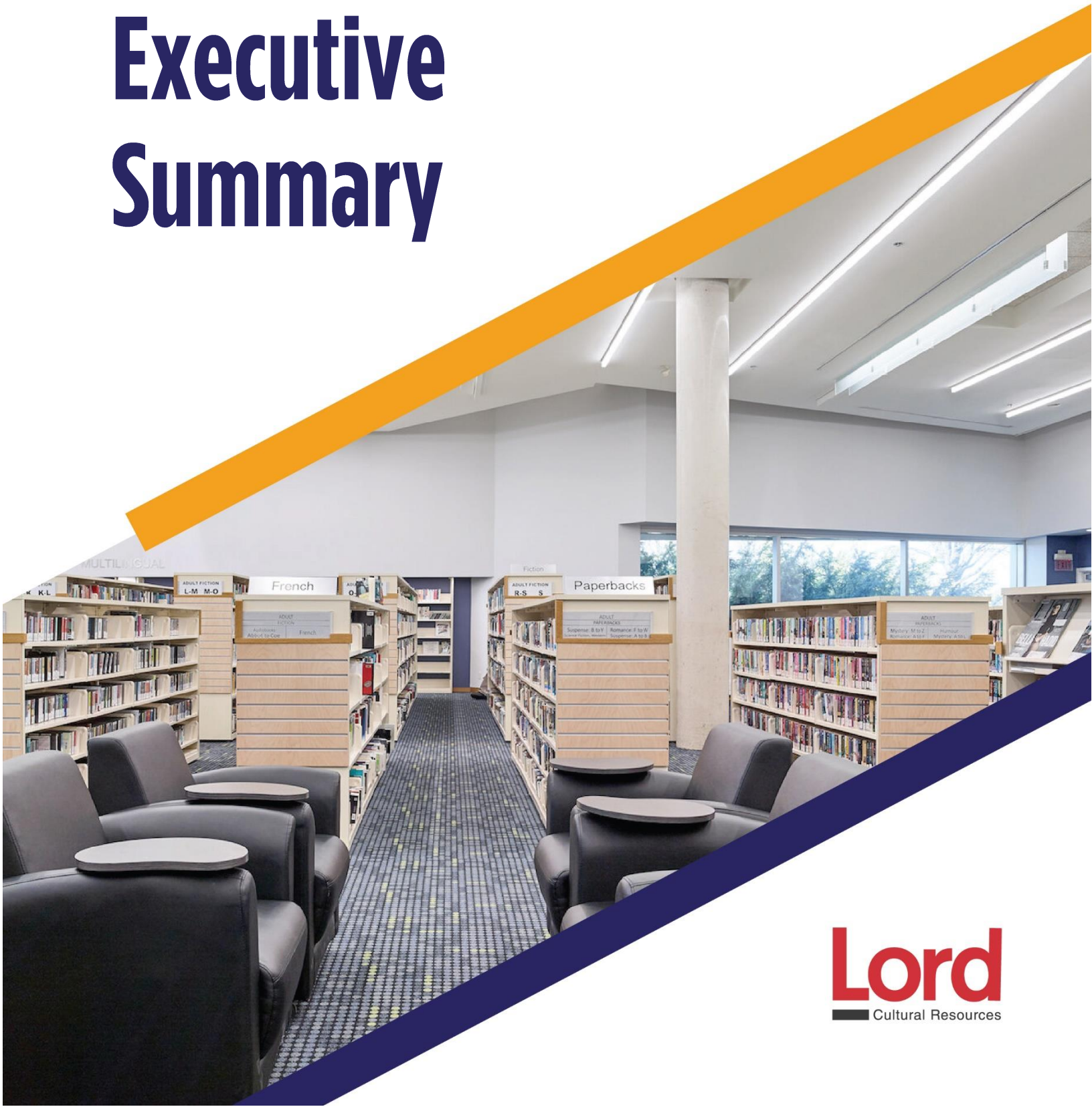
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## SECTION 00

# Executive Summary



# EXECUTIVE SUMMARY

The Ajax Public Library is planning for a new makerspace for the town – the first for Ajax- and has commissioned the following study to determine what is most appropriate for the community.

Makerspaces are shared, community spaces that foster creativity and innovation, support collaboration and interaction amongst peer and like-minded individuals, and facilitates skill development and life-long learning. They provide access to tools and equipment – low tech and high tech for free, teach people how to use the tools, and introduce them to new techniques and skills through workshops, training and educational programming.

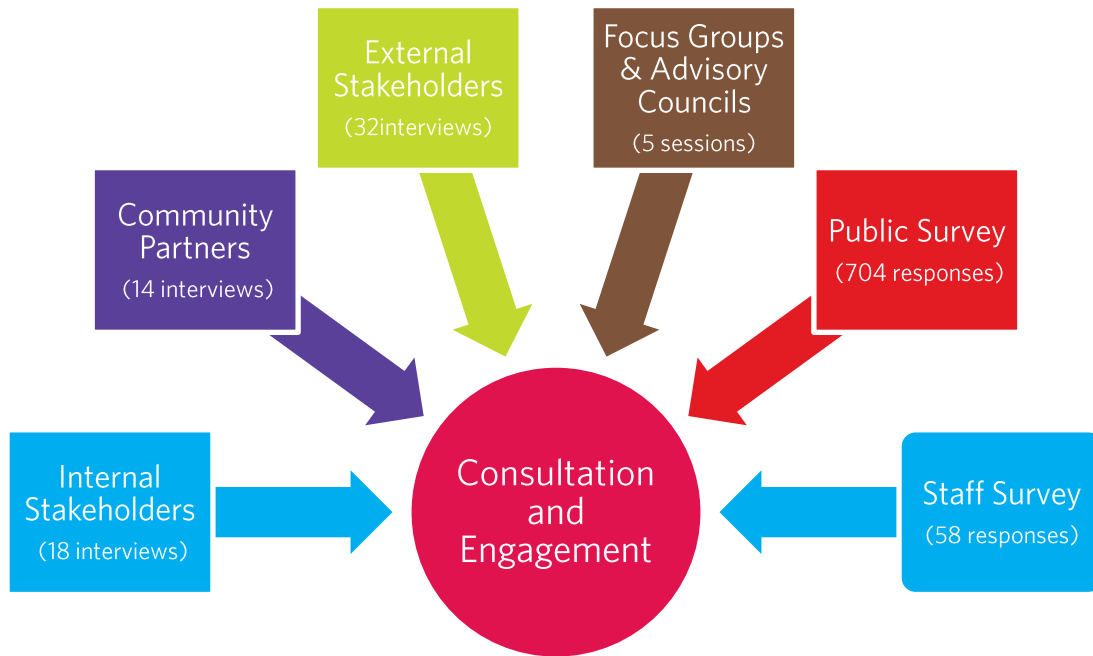


As mentioned, Ajax does not currently have a makerspace. Pickering Public Library, Whitby Public Library, Oshawa Public Library, and Clarington Public Library, neighbouring communities to Ajax, all have makerspaces and maker programs.

Of the 444 library systems in Ontario, just over 65% have makerspaces as of 2019, a 27% increase over the previous year. Of the 18 library systems in Ontario municipalities of similar size to Ajax with population between 100,000 – 250,000 there were 27 makerspaces as of 2019.

While the large number of makerspaces and high usage in comparable-sized municipalities is compelling, it is the benefits to the community and alignment to the Town's strategic goals that are the impetus and rationale for the creation of the makerspace.

Not all makerspaces are alike. Every makerspace is unique to the community it serves. To that end, the consultant team conducted extensive consultation with Ajax Public Library staff and senior management, Town of Ajax Council, Town of Ajax senior staff, key community partners and stakeholders and with the broader Ajax community to determine needs and wants.



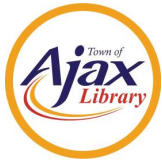
Further, an examination of makerspaces of similar context to Ajax as well as exemplary models across North America was conducted to learn lessons and gain important insights. And a market analysis was developed to understand the demographics and growth areas of the community. All these inputs were used to inform the size and location of the proposed makerspace, the equipment and activities required, the costs to build fit out the spaces and a framework for operation.

19 potential makerspace locations had been assessed for this study. These locations included all three Ajax Public Library branches and Town of Ajax-owned properties throughout the town including recreation and community centres and other properties that had the potential for adaptive re-use.

After evaluating the potential locations, and with overwhelming preference by the public and stakeholders, it was determined that the optimal site for the makerspace should be in one of the three Ajax Public Library branches. Further site tours were conducted for the three branches, and it was determined that either Main Branch or McLean would be most suitable for the makerspace.

Within these two branches, three spaces and four scenarios were identified to be viable options and costed for further consideration as follows:

1. Main Branch – Main Level – 920 sq.ft. @ \$392,000 (Estimated Hard and Soft Construction Costs)
2. McLean Branch – McLean Room #1 - 918 sq.ft. @ \$299,000 (Estimated Hard and Soft Construction Costs)
3. Mclean Branch – McLean Room #1 with extension – 1,435 sq.ft. @ \$453,000 (Estimated Hard and Soft Construction Costs)
4. McLean Branch – Mclean Room #3 – 1,400 sq.ft. @ \$422,000 (Estimated Hard and Soft Construction Costs)



Of the four scenarios above it is our recommendation that the Library move forward with McLean Branch – Community Room #1 without extension for the following reasons:

- McLean is within a community and recreation centre, whereby the library can take advantage of visitors using the other facilities within the complex.
- Community Room #1 is already physically integrated within the branch.
- It has direct and independent access to the front entrance of the community centre, so could operate even if the library is closed.
- It has street visibility, so the space could be branded and signed independently.
- Community Room #1 was costed with and without extension. The cost without extension is considerably less expensive than with extension with minimal disruption and limited intervention to the library space. Even though the space without extension is smaller than with extension, we recommend moving forward with the smaller space given the cost and impact on the library space.
- If demand warrants it, the Library can extend McLean Room #1 at a later date or consider a second location.
- The estimated order of magnitude hard and soft construction costs to retrofit McLean Room #1 with extension is \$299,000.

The Ajax Makerspace will be a community-based program, collaborative, and creative workplace. It will be an inclusive and accessible space where residents of all ages, backgrounds and abilities will be able to experiment, explore, ideate and create.

Located in McLean Room #1 at the McLean branch, the makerspace will be operated, managed and staffed by the APL with an estimated 2.5 FTE's. It will provide free-of-charge access to hands-on tools, instruments, machines and equipment – both low tech and high tech – in a safe and welcoming environment. Additionally, the Makerspace will offer structured and informal learning opportunities including specific classes, workshops and tutorials.

The makerspace will be programmatically and physically organized as three distinct areas:

1. Make Zone
2. Think Zone
3. Create Zones – within these zones are:
  - Craft and Fabric Arts
  - Digital Innovation
  - Coding, Circuitry and Robotics
  - Media Lab

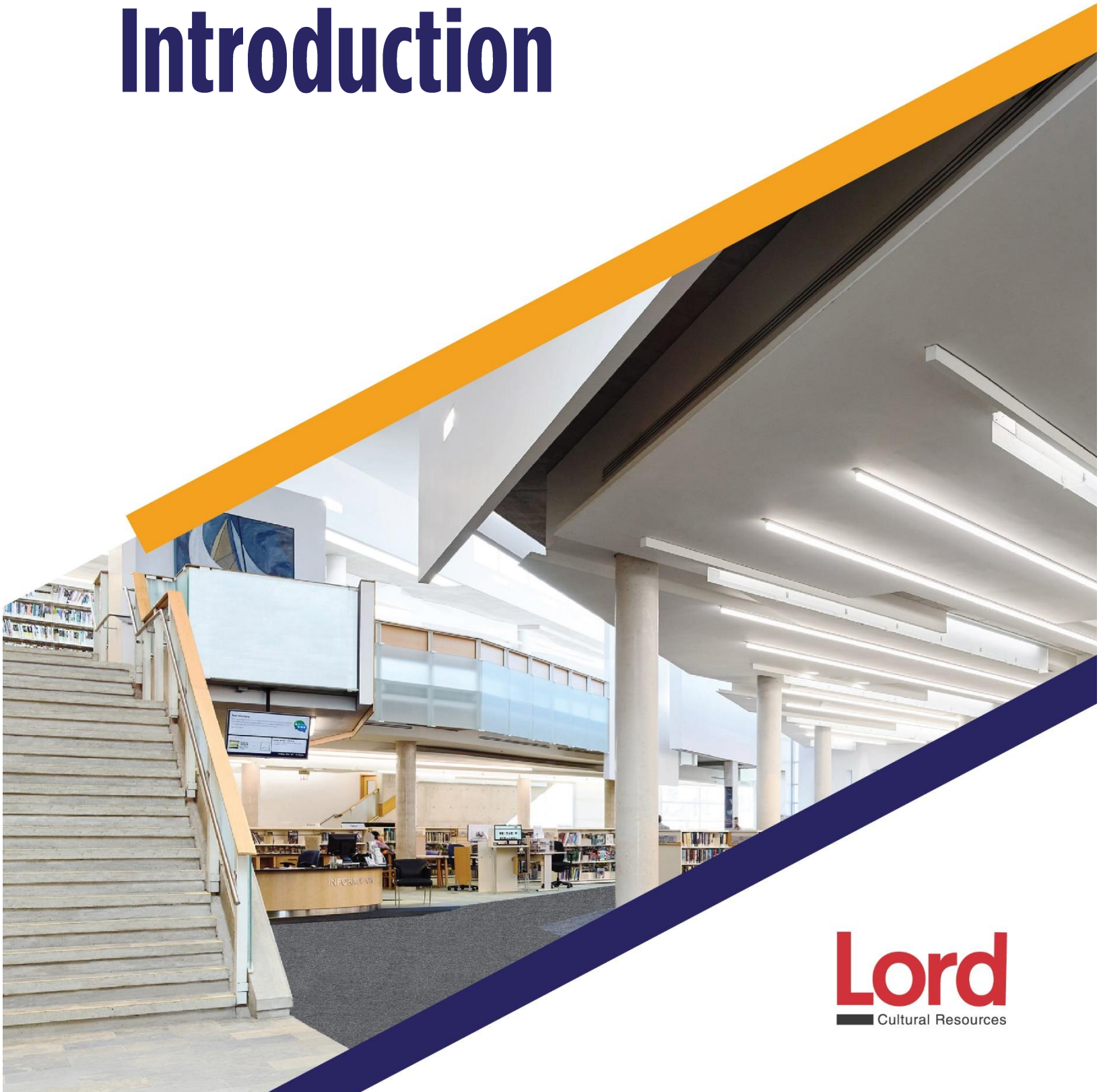
Assuming Council approval for funding in February 2022, it is estimated the completion and delivery of the makerspace will be September 2023.

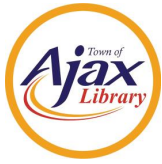


## SECTION 01

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# Introduction





# 1. INTRODUCTION

Public libraries around the continent are enjoying a renaissance in the 21st century. No longer mere repositories of books, libraries are now service resource nodes, local gathering places and, increasingly, community learning centres.

A product of the “maker” movement of the late 1990’s and early 2000s, makerspaces provide people access to tools that enable them to create, to experiment and to showcase or develop creative skills. They are collaborative spaces and the range of tools provided can run the gamut, from high-tech 3-D printers to ordinary hand tools. They continue to grow in popularity and are increasingly found not only in libraries but also in museums, community centres and other locations.

It is within this context that the Ajax Public Library is planning for a makerspace – there is currently no makerspace in the town of Ajax. At the outset, the makerspace was contemplated to be in an Ajax Public Library branch or in another municipally owned facility. Regardless of location, the Ajax Public Library will manage and operate the makerspace.

Not all makerspaces are alike. Every makerspace is unique to the community it serves. And so the purpose of this study is to determine what kind of makerspace is most appropriate for Ajax. To that end, the consultant team conducted extensive consultation with Ajax Public Library staff and senior management, Town of Ajax Council, Town of Ajax senior staff, key community partners and stakeholders and with the broader Ajax community to determine needs and wants.

Additionally, a review of a select group of exemplary makerspaces in North America was undertaken to understand how makerspaces work and operate, examine best practices and successes, and learn from mistakes made.

These critical inputs informed what type of programming, activities and equipment are best suited for Ajax. Further, these findings helped to determine the optimal location for the makerspace and size of space required. Once these two key components were established, capital costs were applied, and an operating framework was developed.



## SECTION 02

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# A MAKERSPACE IN AJAX



## 2. A MAKERSPACE IN AJAX

### 2.1 DEFINING A MAKERSPACE

There is no clear-cut definition for a makerspace but rather a general term to describe a manufacturing, creating, and “making” space, which allows people to pursue a variety of interests, including art, electronics, woodcraft, sewing crafts, mechanics, computer software and programming, robotics and other creative and hands-on activities. Although the sizes, the specific activities and equipment vary from space to space they do have one thing in common – they are based on the ideal of community, in the broadest senses.

Makerspaces are shared, community spaces that foster creativity and innovation, support collaboration and interaction amongst peer and like-minded individuals, and facilitates skill development and life-long learning. They provide access to tools and equipment – low tech and high tech for free, teach people how to use the tools, and introduce them to new techniques and skills through workshops, training and educational programming.

The other important aspect of a makerspace is that it is open and accessible to all, regardless of age, gender, ability or background. Makerspaces are most often located in and operated by public institutions such as recreation and community centres, schools, museums, science centres and public libraries. There are, however, makerspaces that are independent of a structured institution such as a public library. These include non-profit, membership-based entities as well privately-owned fee-based companies. The latter tends to cater to older kids and younger teens and offer group and individual classes, summers camps and birthday parties.

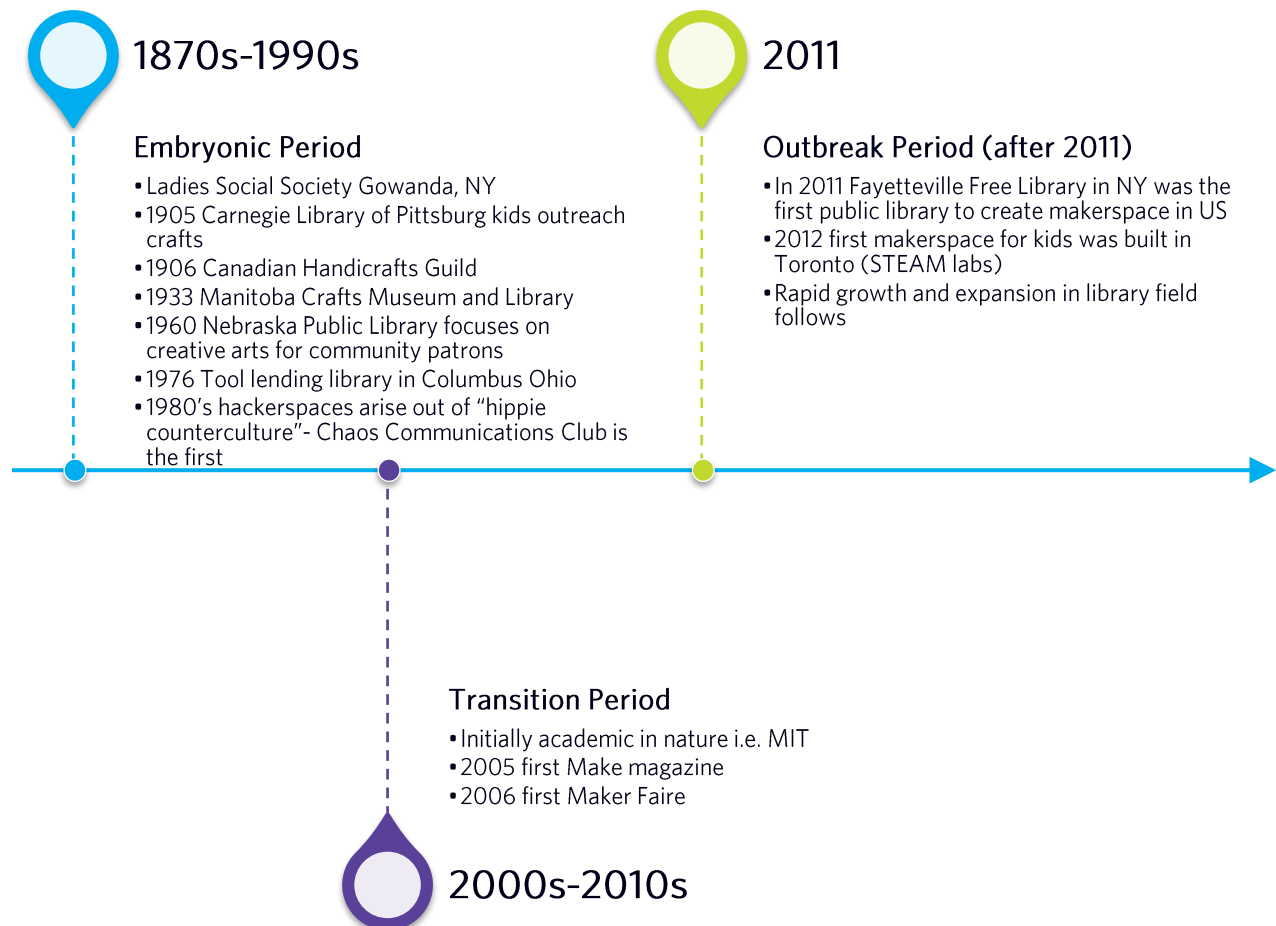
Below is a simple, illustrative definition of a makerspace.



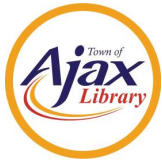
## 2.2 A BRIEF HISTORY OF MAKERSPACES

Makerspaces have developed throughout history, beginning as early as 1873. The makerspace model has been utilized and championed by many different organizations, from libraries to informal hacker collectives, to Make:Magazine, a publication focused on maker culture. Today, Makerspaces are a global phenomenon, with an estimated 2,000 makerspaces existing worldwide. Makerspaces go by many names – including hackerspace, FabLab and Techshop – but all share one similarity; they are all places for making, collaborating, learning, and sharing.

Below is a timeline of the history of makerspaces.



Shanshan, Yu. *Makerspaces as learning spaces: An historical overview and literature review*, 2020. Department of Secondary Education, University of Alberta.



## 2.3 WHY A MAKERSPACE IN AJAX?

The simple answer to why Ajax needs a makerspace is because one does not currently exist in the town. Pickering Public Library, Whitby Public Library, Oshawa Public Library, and Clarington Public Library, neighbouring communities to Ajax, all have makerspaces and maker programs.

### 2.3.1 A Portrait of Ontario Library Makerspaces



18 MUNICIPAL LIBRARY SYSTEMS



27 TOTAL MAKERSPACES IN 2019



1.9 PER SYSTEM



6503 AVERAGE USERS PER SYSTEM



3612 AVERAGE USERS PER MAKERSPACE

Of the 444 library systems in Ontario, just over 65% have makerspaces as of 2019, a 27% increase over the previous year. Of the 18 library systems in Ontario municipalities of similar size to Ajax with population between 100,000 – 250,000 there were 27 makerspaces as of 2019.

While the large number of makerspaces and high usage in comparable-sized municipalities is compelling, it is the benefits to the community and alignment to the Town’s strategic goals that are the impetus and rationale for the creation of the makerspace. The benefits and municipal strategic alignment are as follows:

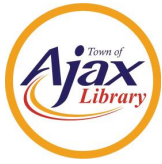
## 2.4 COMMUNITY BENEFITS

### 2.4.1 Accessibility and Inclusivity

As a function of the library, the makerspace is an open and welcoming environment and the programs, services and equipment will support the interests and learning for all residents and Ajax regardless of age, background abilities.

#### 1. Innovation and Creativity

Makerspaces help build critical thinking skills and foster innovation through hands-on experimentation. Participants have the opportunity to be creative and apply personalized learning strategies to make changes to existing concepts or develop their own ideas, methods or products.



## 2. Entrepreneurism and Employment

The creative output developed through the makerspace can provide a greater sense of entrepreneurship for its users. Further the skills developed in the makerspace broadens opportunities for future employment.

## 3. Community Engagement and Cohesion

Makerspaces are social spaces that support wellbeing and community cohesion by serving the needs of the community and reaching out to marginalized, excluded and at-risk groups.

## 4. Life-long Learning

Makerspaces provide environments where learners of all ages and skill levels have the opportunity to explore, experiment, and create for their own personal fulfillment throughout one's lifetime.

## 5. Youth Support

Makerspaces are equitable, democratic, and safe spaces that provide opportunities for youth to participate and interact within a communal format.

## 6. Library Usage

The broad range of programs and services offered through the makerspace will expand usage to the library.

## 2.5 ALIGNMENT WITH TOWN STRATEGIES

The Town of Ajax's strategic plan, *Stronger Together*, communicate Council's "innovative, aggressive and inclusive path" for Ajax over a five-year planning horizon from 2018-2022. The plan sets out a framework organized around 3 focus areas, 21 goals and 148 actions. The following are the Town's goals and actions that align with the makerspace:

### Focus Area:

#### Connecting Our Community

#### Goal:

Creating a more engaged community.

#### Action:

- Facilitate unique opportunities to meet and consult with residents within neighbourhoods and leverage our various facilities.

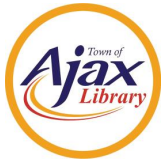
#### Goal:

Creating opportunities to foster a welcoming and inclusive community.

#### Action:

- Expand inclusion programming at the Ajax Public Library.





- Continue to provide training to Ajax Public Library staff on initiatives and technology to support and service diverse and marginalized customers.
- Increase awareness of accessibility and create a climate of inclusivity through public education and outreach.

**Goal:**

**Promoting a range of programs, services, and supports for all ages and abilities.**

**Action:**

- Deliver opportunities for lifelong learning (i.e. adults 55+yrs).
- Develop technology programming for youth, seniors, and businesses with our community partners.



## SECTION 03

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# CASE STUDIES



## 3. CASE STUDIES

### 3.1 INTRODUCTION

Now that the rationale for a makerspace has been established, which type of makerspace is right for Ajax must be determined. To help make that determination (along with other key inputs) a study of existing makerspaces both in Canada and the US of varying types to review operations, equipment, and programming was undertaken.

### 3.2 METHODOLOGY

The case study analysis investigates various makerspace models within public libraries as well as others that are operated out of museums, science centres and community centres. Makerspaces selected include those that are located in relatively close proximity to Ajax as well as others across the province, the country and the US that are considered to be exemplars. Studies of library makerspaces located in Southern Ontario were used to better understand how other libraries have chosen to serve the local Ontario market. Other library makerspaces located across Canada and the US were used to understand trends in library makerspaces, and study how unique offerings related to community need and engagement. Finally, a number of non-library makerspaces were included to better understand overall trends, alternative operational styles, and success metrics across the wider makerspace industry. Through these case studies, trends, success factors, and lessons learned were identified that are most relevant to the Ajax context. Full Case Studies are available in Appendix A.

### 3.3 TRENDS AND KEY TAKEAWAYS

#### 3.6.1 Integrated Use

Makerspaces within public institutions are increasingly focused on providing positive educational outcomes for users. A shift is taking place from simply providing access to tools to facilitating meaningful making. This shift takes a few key forms:

- Increased workshops, public programs, and staff supervision
- Less focus on demonstration and more on contextualized, applied learning
- Integrating tools and spaces into a larger learning curriculum



Image: Open Shelf (<https://open-shelf.ca/160615-trends-makerspaces/>)



- Allocating more resources towards programming and staffing (instead of expensive equipment)

Because some libraries don't have the financial resources to provide full time staffing to compliment their physical facilities, they have used volunteers and students with specific expertise to lead programs or provide guidance to makerspace users.

### 3.6.2 Expanding Scope of Resources

While makerspaces have traditionally focused on providing access to technological and electronic resources that may be expensive or impractical for individuals to own, today's makerspaces are including a wider range of facilities to accommodate the changing needs of users. For example, the Lou Duggan Creative Studio at Halifax Public Library includes a full kitchen and gardening resources alongside more traditional makerspace offerings (like 3D printers and vinyl cutters). The Bubbler (at Madison Public Library) blends art and technology in a specific effort to reach out to at-risk youth.



Image: The Bubbler (<http://madisonbubbler.org/learninginlibraries>)

Other library makerspaces are incorporating more resources for children, including some who have created separate spaces to meet the specific needs of young makers.

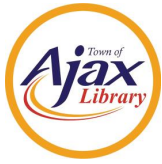
### 3.6.3 Increasing Access

Libraries are taking a wide variety of steps to increase accessibility for all communities:

- **Engagement outside the physical space:** Many makerspaces provide loanable technology (such as GoPro cameras, wi-fi hotspots, and green screen kits) to encourage making outside their facilities. Some makerspaces (The Bubbler) provide maker kits with instructions and tools for teachers, parents, or individuals to lead maker activities in their own spaces.
- **Online Offerings:** In part as a reaction to restrictions caused by the COVID-19 pandemic, library makerspaces are offering programs and workshops online



Image: Makerspace Kits at The Bubbler (<http://madisonbubbler.org/resources-1>)



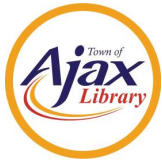
- **Targeting Communities:** Some libraries (like the Denver Public Library) are locating their makerspaces in traditionally under-resourced communities to provide greater access to technology and other resources for those who may not have access in other parts of their lives.
- **Cost Accessibility:** Many library makerspaces are decreasing cost to users, both by eliminating printing fees and by providing training on free and open-source software.

## SECTION 04

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# MARKET ANALYSIS





# 4. MARKET ANALYSIS

## 4.1 INTRODUCTION

The following analysis examines the potential location for a makerspace based on current population and projected growth patterns. The locations reviewed are Ajax Public Library branches, municipal community centres and other municipally owned spaces.

Additionally, the analysis looks at accessibility of location, that is how easy or hard is it for the potential user to get to by transit, by walking or by bike. The analysis does not consider, at this point, availability of space within a particular location, condition of space or preference of users. These factors have been assessed though consultation discussed in the following chapter.

## 4.2 KEY SITE CONSIDERATIONS

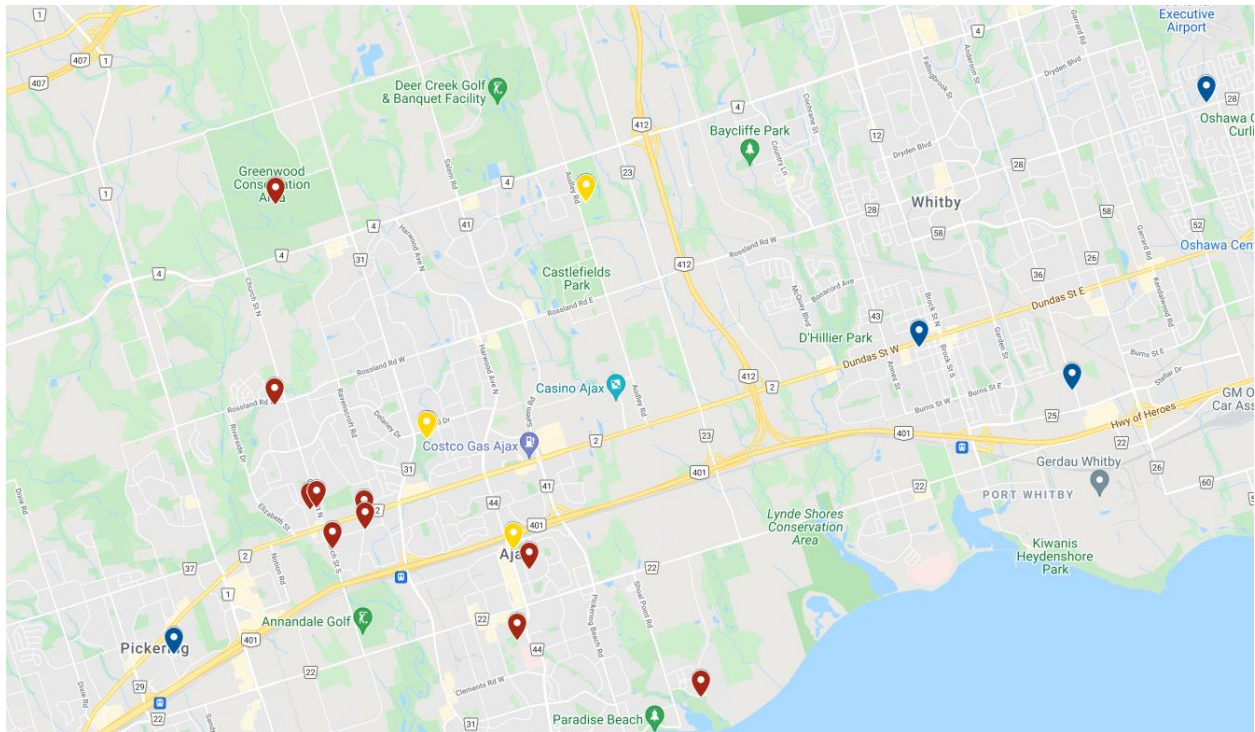
- **Demographics-** what demographics are in the 1 km radius surrounding each location’s dissemination area- how closely does it align with the greater Ajax community? Are there specific pockets of population in a given area that can be identified.
- **Walkability, Bikeability and Transit accessibility-** determined using Walk Score (n.d) *WalkScore*<https://www.walkscore.com/>-
- **AODA Compliance-** Once location opportunities have been narrowed down physical accessibility of spaces will need to be considered.

	Walk Score	Bike Score	Transit Score
90-100	Walker’s Paradise	Biker’s Paradise	Rider’s Paradise
70-89	Very Walkable	Very Bikeable	Excellent Transit
50-69	Somewhat Walkable	Bikeable	Good Transit
25-49	Car-Dependent	Somewhat Bikeable	Some Transit
0-24	Very Car-Dependent		Minimal Transit

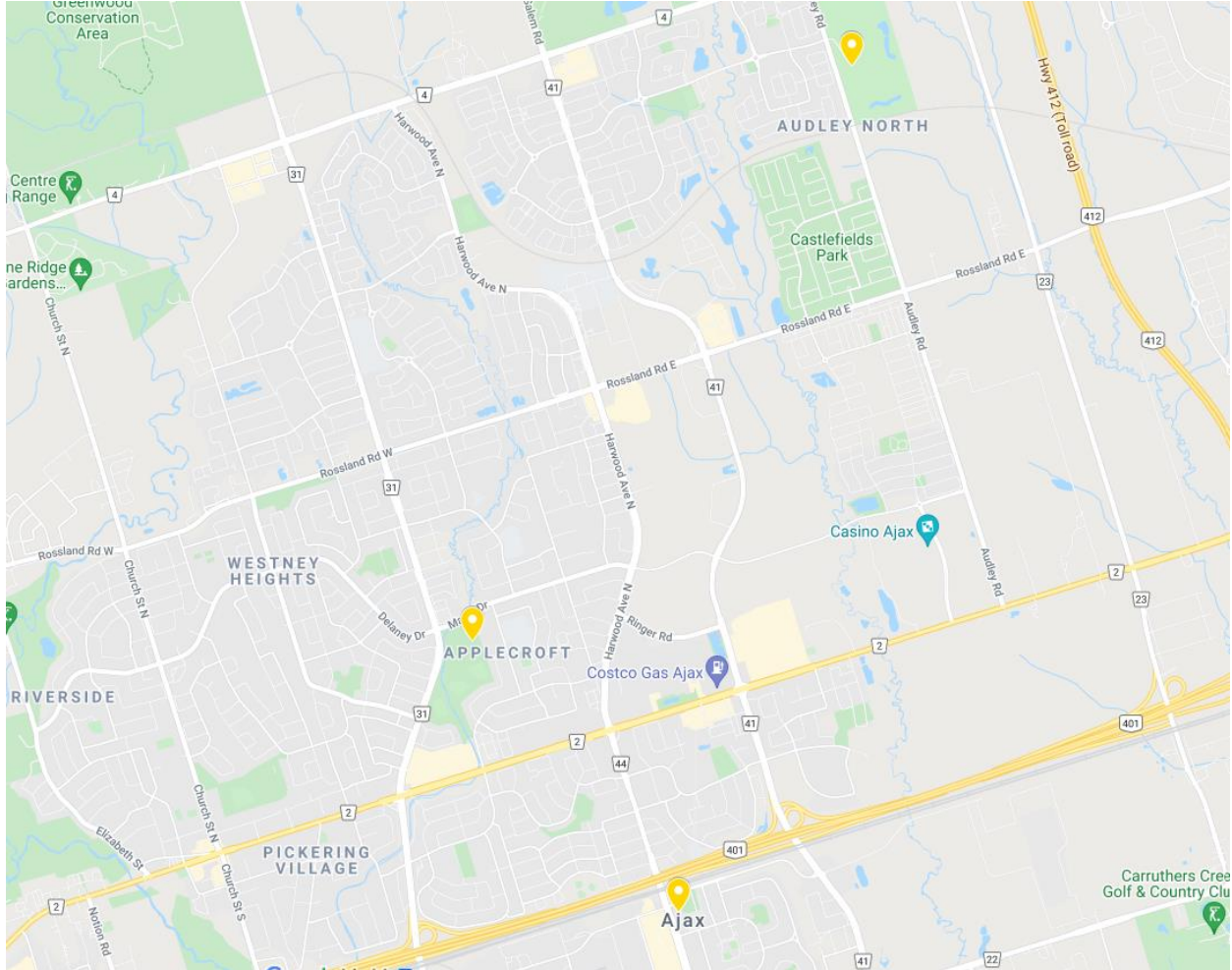


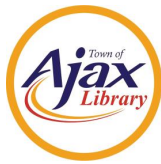
## Ajax Public Library- Makerspace Study Map

The below map displays the location of the three existing Ajax Public Library branch locations (yellow), other Town of Ajax owned properties studied (red), and indicates the location of nearby Makerspaces in other communities (blue) for consideration when selecting potential locations.



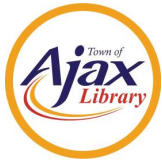
### 4.3 MARKET ANALYSIS: LIBRARY BRANCHES



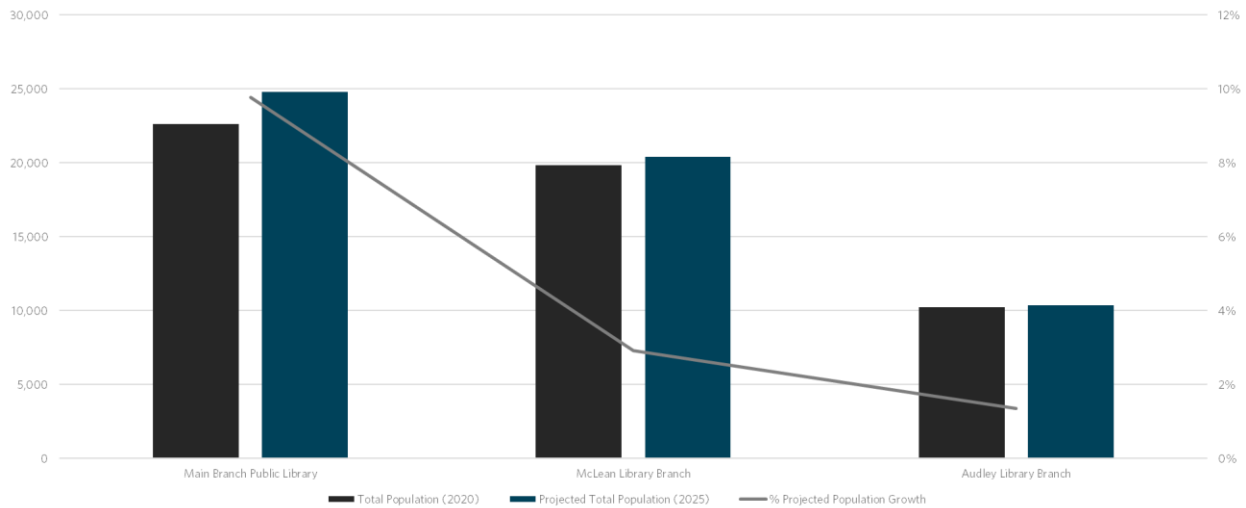


The following outlines the demographics of the areas for the three library branches. All location profiles are based on a 1km radius from the dissemination area of the location

	Library Branches			Other		
	Main Branch Public Library	McLean Library Branch	Audley Library Branch	Ajax, ON (CSD)	Ontario	Canada
Total Population (2020)	22,595	19,821	10,209	134,566	14,666,590	37,983,097
Projected Total Population (2025)	24,800	20,399	10,346	148,877	15,580,597	40,172,572
% Projected Population Growth	10%	3%	1%	11%	6%	6%
<b>Population Age</b>						
0 to 4	5.45%	4.89%	7.69%	5.79%	4.99%	5.14%
5 To 9	5.52%	5.37%	10.27%	6.44%	5.18%	5.34%
10 to 14	5.20%	5.73%	9.39%	6.68%	5.42%	5.45%
15 to 19	5.67%	6.57%	7.55%	6.78%	6.00%	5.80%
20 to 24	6.25%	7.27%	5.42%	6.79%	6.43%	6.14%
25 To 29	7.54%	8.20%	5.27%	7.03%	7.01%	6.82%
30 To 34	7.98%	6.94%	6.28%	7.02%	7.01%	6.99%
35 To 39	7.09%	6.55%	9.53%	7.27%	6.69%	6.82%
40 To 44	5.82%	5.66%	10.05%	6.92%	6.38%	6.54%
45 To 49	6.21%	6.34%	7.79%	6.79%	6.42%	6.32%
50 To 54	6.86%	6.88%	5.58%	6.77%	6.69%	6.52%
55 To 59	7.84%	8.66%	4.51%	7.55%	7.36%	7.26%
60 To 64	6.31%	6.98%	3.51%	5.87%	6.58%	6.76%
65 To 69	5.05%	5.16%	2.70%	4.33%	5.49%	5.70%
70 To 74	4.11%	3.69%	2.31%	3.33%	4.60%	4.70%
75 To 79	2.61%	2.10%	1.28%	2.08%	3.16%	3.22%
80 To 84	2.11%	1.50%	0.58%	1.36%	2.21%	2.16%
85 Or Older	2.39%	1.49%	0.29%	1.22%	2.37%	2.30%
<b>Visible Minorities</b>						
% Household Population by Visible Minority Status	53.11%	61.14%	87.23%	63.89%	32.62%	25.28%
# Household Population by Visible Minority Status	12,001	12,118	8,905	85,977	4,784,186	9,600,545
<b>Gender</b>						
% Male Population	48.35%	48.74%	49.84%	48.83%	49.34%	49.68%
% Female Population	51.65%	51.26%	50.16%	51.17%	50.66%	50.32%



### 4.3.1 Ajax Public Library Branches: Current and Project Population Growth



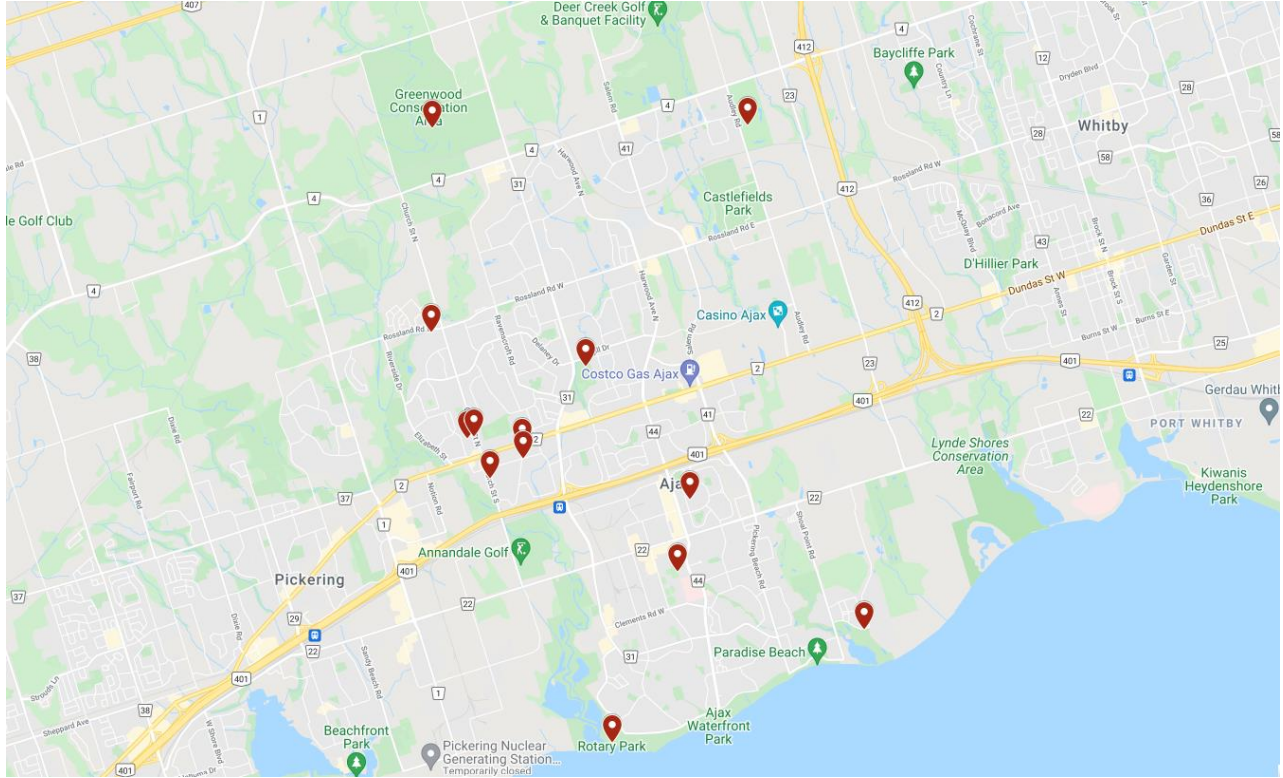
	Library Branches		
	Main Branch Public Library	McLean Library Branch	Audley Library Branch
Walk Score	74	64	9
Bike Score	43	Unavailable	Unavailable
Transit Score	39	50	Unavailable

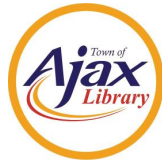
### 4.3.2 Market Analysis: Library Branches

- Of the library branches, Main Branch has the highest current and projected population in the surrounding area. Main Branch has a higher proportion of individuals aged 65 and older than the other branches, or Ajax as a whole
- Audley Branch has a higher proportion of individuals aged 18 and under than the other branches, or Ajax as a whole.
- Main is the most walkable location, while Mclean is more accessible via transit.
- The areas surrounding the Audley and Mclean branches have a higher proportion of individuals who identify as a visible minority and more closely align with the diversity of the overall community of Ajax.



## 4.4 MARKET ANALYSIS: TOWN OF AJAX OWNED PROPERTIES



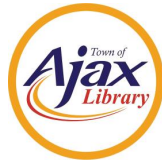


The following outlines the demographics of the areas for Town-owned facilities. All location profiles are based on a 1km radius from the dissemination area of the location

	Town of Ajax Owned Locations												
	Ajax Community Centre	Audley Recreation Centre	Carruthers Marsh Pavilion	Greenwood Discovery Pavilion	Hartrick House	McLean Community Centre	Quaker Meeting House	Rotary Park Pavilion	St. Andrew's Community Centre	St. Francis Centre for Community, Arts & Culture	Old Mill Street Fire Hall	Old Village Courthouse	Old Village Library Branch
Total Population (2020)	15,739	10,209	8,454	20,593	15,305	19,821	8,526	10,879	12,066	7,595	8,801	11,528	11,528
Projected Total Population (2025)	17,069	10,346	9,128	24,519	17,416	20,399	8,877	11,955	13,402	8,057	8,989	12,241	12,241
% Projected Population Growth	8%	1%	8%	19%	14%	3%	4%	10%	11%	6%	2%	6%	6%
<b>Population Age</b>													
0 to 4	4.60%	7.69%	5.77%	6.92%	5.27%	4.89%	3.98%	4.35%	5.88%	3.94%	4.23%	3.94%	3.94%
5 To 9	4.57%	10.27%	6.91%	7.91%	5.57%	5.37%	3.92%	4.77%	6.02%	3.78%	4.20%	4.22%	4.22%
10 to 14	4.96%	9.39%	7.16%	7.63%	6.19%	5.73%	5.18%	5.32%	5.28%	5.19%	5.17%	6.02%	6.02%
15 to 19	5.20%	7.55%	6.93%	7.19%	7.57%	6.57%	6.53%	5.28%	5.55%	7.20%	6.25%	8.27%	8.27%
20 to 24	5.79%	5.42%	5.88%	6.86%	8.59%	7.27%	7.54%	5.74%	5.93%	8.23%	7.43%	9.46%	9.46%
25 To 29	6.56%	5.27%	5.37%	7.03%	8.04%	8.20%	7.33%	6.25%	7.15%	7.48%	7.75%	7.47%	7.47%
30 To 34	7.22%	6.28%	5.39%	7.51%	6.90%	6.94%	6.05%	6.83%	7.88%	6.37%	6.78%	5.31%	5.31%
35 To 39	6.56%	9.53%	5.99%	8.39%	6.64%	6.55%	5.54%	6.30%	7.41%	5.21%	5.95%	5.20%	5.20%
40 To 44	5.82%	10.05%	7.65%	7.65%	5.23%	5.66%	4.55%	5.95%	6.03%	4.52%	4.78%	4.31%	4.31%
45 To 49	5.92%	7.79%	8.15%	6.92%	6.46%	6.34%	5.61%	5.62%	6.29%	6.04%	5.52%	6.55%	6.55%
50 To 54	6.81%	5.58%	7.11%	6.54%	8.28%	6.88%	7.98%	6.40%	6.88%	8.62%	7.56%	9.41%	9.41%
55 To 59	8.11%	4.51%	8.47%	6.24%	8.81%	8.66%	9.62%	9.03%	7.26%	9.45%	9.70%	10.15%	10.15%
60 To 64	6.56%	3.51%	6.22%	4.63%	6.29%	6.98%	8.13%	8.17%	5.59%	7.61%	8.10%	7.31%	7.31%
65 To 69	5.86%	2.70%	4.15%	3.25%	4.06%	5.16%	5.78%	6.77%	5.04%	5.25%	5.72%	4.71%	4.71%
70 To 74	5.46%	2.31%	3.68%	2.28%	2.52%	3.69%	4.97%	5.48%	4.13%	4.37%	4.70%	3.27%	3.27%
75 To 79	3.76%	1.28%	2.70%	1.57%	1.65%	2.10%	3.03%	3.26%	2.73%	2.74%	2.69%	1.78%	1.78%
80 To 84	3.02%	0.58%	1.63%	0.75%	1.03%	1.50%	2.40%	2.30%	2.34%	2.20%	1.89%	1.38%	1.38%
85 Or Older	3.22%	0.29%	0.84%	0.72%	0.91%	1.49%	1.86%	2.21%	2.60%	1.79%	1.57%	1.26%	1.26%
<b>Visible Minorities</b>													
% Household Population by Visible Minority Status	35.56%	87.23%	33.61%	81.41%	69.68%	61.14%	41.13%	31.06%	54.35%	44.48%	47.71%	55.11%	55.11%
# Household Population by Visible Minority Status	5,596	8,905	2,841	16,765	10,664	12,118	3,507	3,379	6,558	3,378	4,199	6,353	6,353
<b>Gender</b>													
% Male Population	47.54%	49.84%	49.75%	49.22%	49.45%	48.74%	48.48%	47.98%	48.14%	49.03%	49.16%	48.89%	48.89%
% Female Population	52.46%	50.16%	50.25%	50.78%	50.55%	51.26%	51.52%	52.02%	51.86%	50.97%	50.84%	51.11%	51.11%

Source: SimplyAnalytics (2021) Environics Demographic Estimates, Accessed March 29, 2021

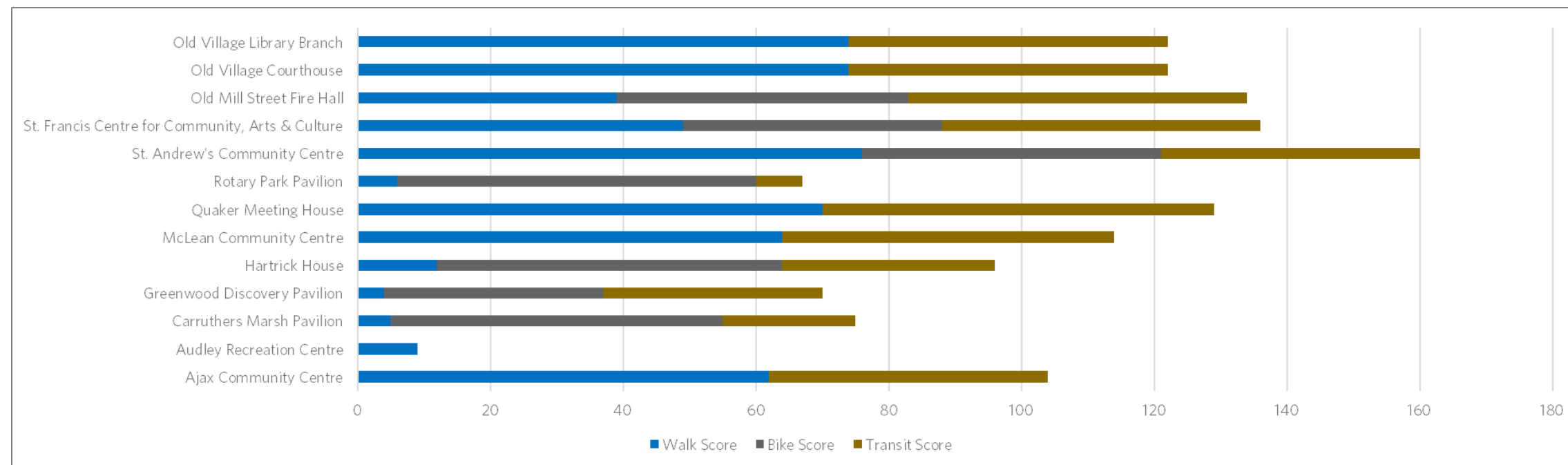




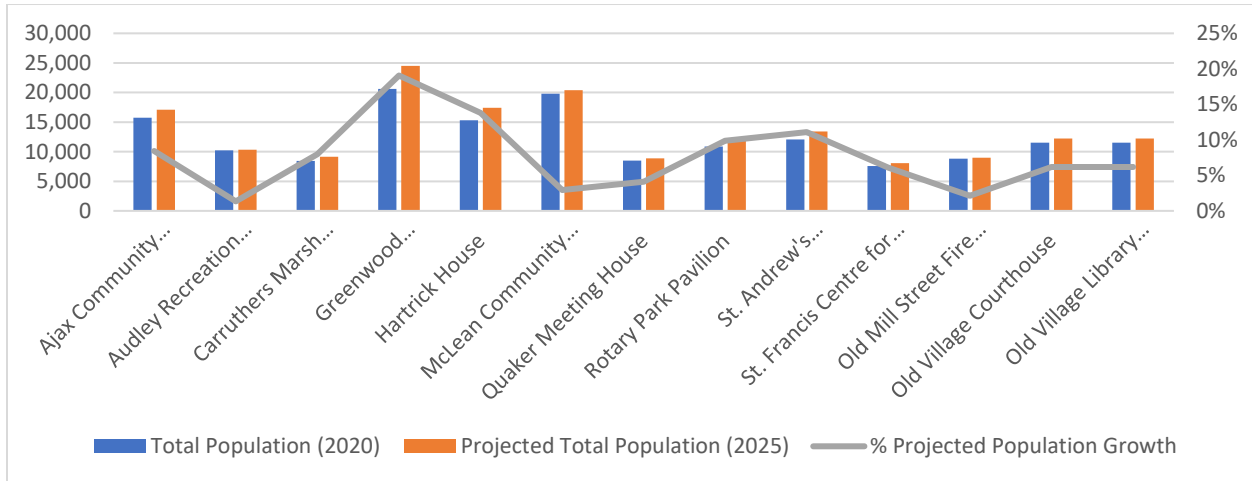
### 4.4.1 Town of Ajax- Owned Properties - Accessibility

	Ajax Community Centre	Audley Recreation Centre	Carruthers Marsh Pavilion	Greenwood Discovery Pavilion	Hartrick House	McLean Community Centre	Quaker Meeting House	Rotary Park Pavilion	St. Andrew's Community Centre	St. Francis Centre for Community, Arts & Culture	Old Mill Street Fire Hall	Old Village Courthouse	Old Village Library Branch
Walk Score	62	9	5	4	12	64	70	6	76	49	39	74	74
Bike Score	N/A	N/A	50	33	52	N/A	N/A	54	45	39	44	N/A	N/A
Transit Score	42	N/A	20	33	32	50	59	7	39	48	51	48	48

Source: SimplyAnalytics (2021) Envirionics Demographic Estimates, Accessed March 29, 2021



### 4.4.2 Town of Ajax- Owned Properties: Current and projection population



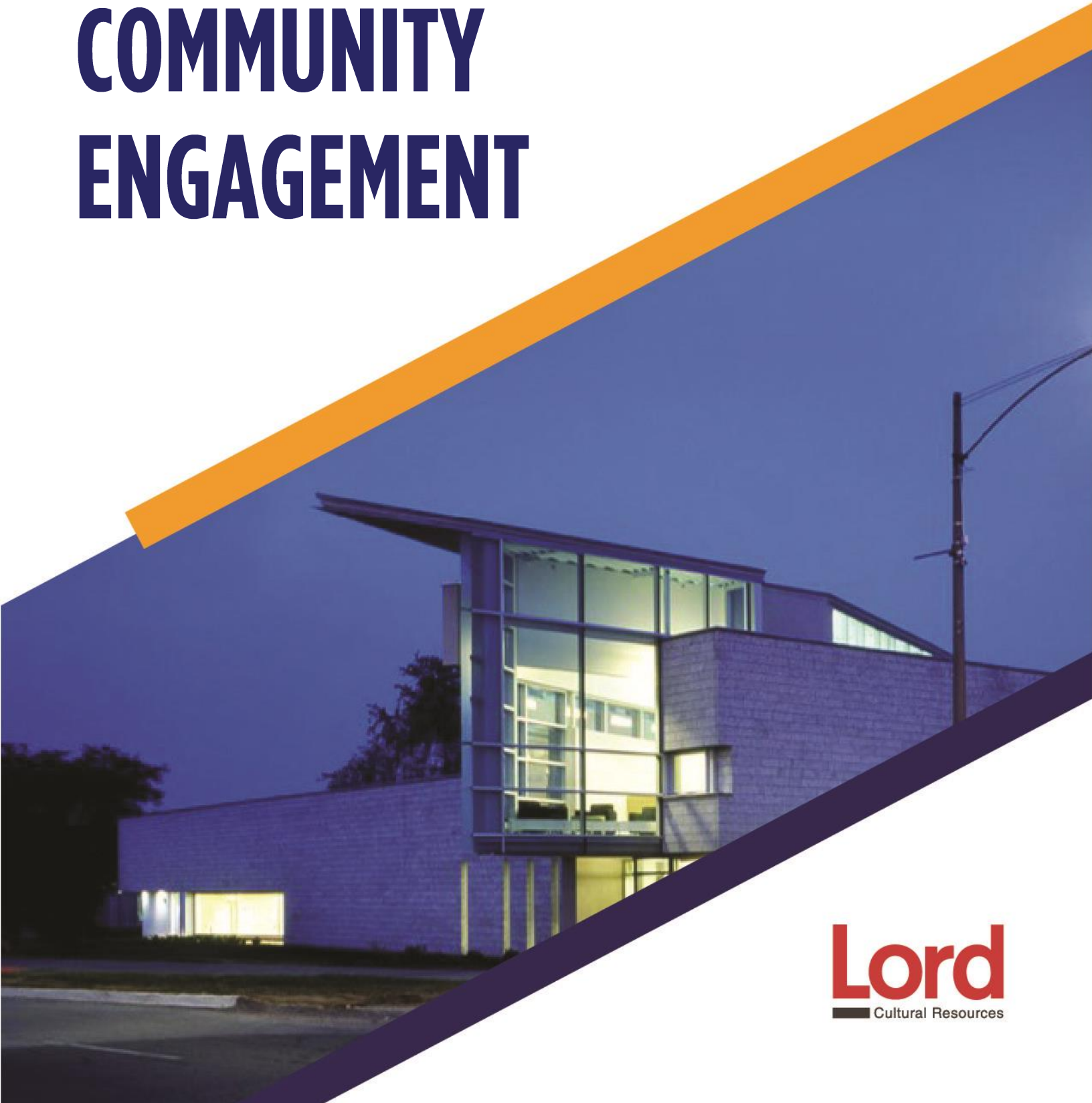
### 4.4.3 Market Analysis: Town of Ajax Owned Properties

- Greenwood Discovery Pavilion has the highest population in the surrounding area, as well as one of the most diverse populations surrounding it (81.41% identifying as visible minorities). It is also the location with the fastest projected population growth of the locations studied.
- The Quaker Meeting House has a relatively low surrounding population area, however it has the strongest transit access of locations studied.
- Ajax and Mclean community centres score highly for both population area and transit score
- Audley recreation Centre, Greenwood Discovery pavilion, Hartrick House, and McLean Community Centre, are adjacent to populations which are roughly equally, or more diverse than the overall Ajax community. (60% or higher visible minority)
- Second only to Quaker meeting house, the Old Village Court House and Old Village Library Branches score highest in terms of walkability and transit accessibility on average.

## SECTION 05

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# CONSULTATION AND COMMUNITY ENGAGEMENT



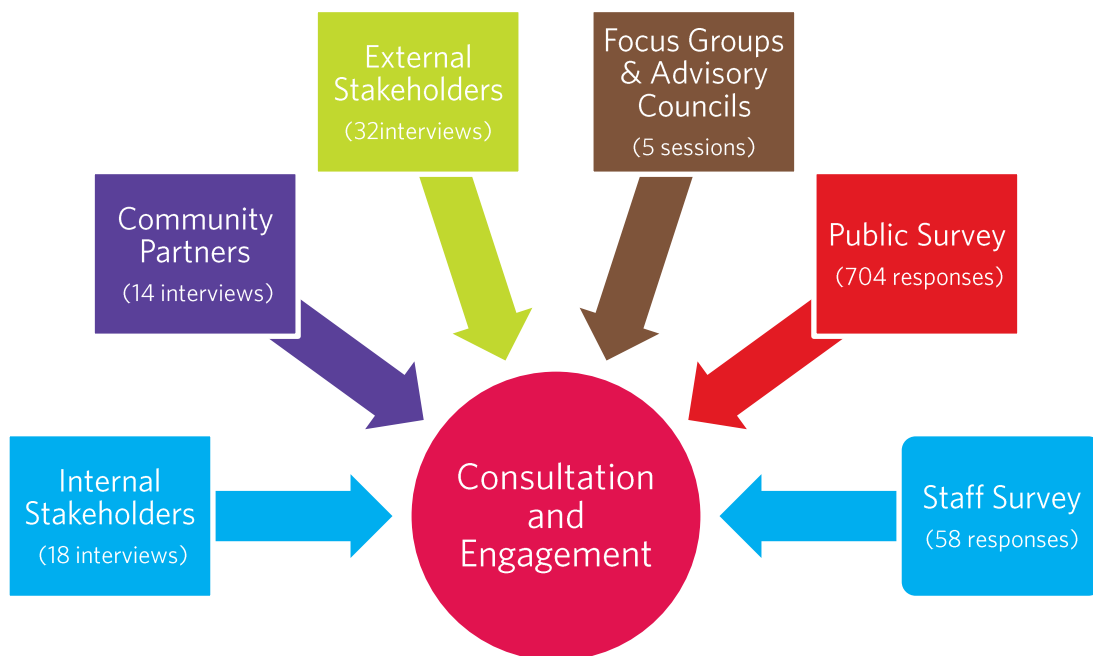
# 5. CONSULTATION AND COMMUNITY ENGAGEMENT

## 5.1 INTRODUCTION

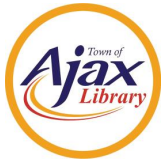
A critical component to this study was the extensive consultation that was conducted with library staff and senior management, Town of Ajax staff and elected officials, community partners and stakeholders and the public. While the case studies and market analysis help to inform the general framework for the makerspace it is the input from stakeholders and the community - needs and wants- that starts to define what the makerspace will be for Ajax.

Individuals were consulted through:

1. One-on-One interviews - 64 interviews in total with senior library staff, Town of Ajax staff, councillors and mayor, community partners, and stakeholders.
2. Focus Groups and Workshops - 5 focus groups and workshops with teen and older adult advisory committees and general community and youth groups
3. Surveys - 2 surveys: 1 survey to the Ajax community, 1 survey to Ajax Public Library staff







## 5.2 KEY FINDINGS – INTERVIEWS, FOCUS GROUPS AND WORKSHOPS

The following is a summary of the key findings derived through interviews, focus groups and workshops. It is important to note that these are not recommendations by the consultant team but rather thoughts, suggestions, comments and in some cases recommendations put forward by interview subjects, and focus group and workshop participants. A detailed summary of findings is included as Appendix A.

### Support

Consultation findings revealed wide-spread support for a makerspace in Ajax amongst stakeholders, community partners, senior library management, advisory group and Town Council. While there were differences of opinion with respect to the specifics such as location, equipment and activities, consultation revealed the demand for a makerspace within the Town of Ajax.

### Audience/Users

Makerspaces are community spaces and therefore open to all residents of Ajax. The activities and programs should be broad-based and serve all age groups. In particular, it should be broad-based and open to everybody. It should be multi-generational and appeal to Ajax's many diverse communities. While the makerspace is open to all, the activities and equipment are focused on youth and teens.

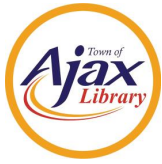
### Goals

A number of overarching goals were identified through the consultation process. The following is a summary of the overarching goals.

- A makerspace in Ajax should facilitate community engagement and help create greater community cohesion.
- As a community space and program, the makerspace should support the interests of and learning for people of all ages. Like the library, the makerspace should be multi-generational.
- Through programs and activities and through the collective process of making and creating, the makerspace should be a place that foster entrepreneurship and create skills training to broaden opportunities for employment.
- A makerspace must support Ajax's youth in terms of discovery, development, and exploration of skills.
- A makerspace must create opportunities for life-long learning.
- From both a Town perspective and a library perspective, the makerspace should expand overall library usage and participation.

### Inclusivity

The makerspace must be accessible physically, intellectually, and socially. It must be welcoming, inviting, and inclusive to ensure equitable participation for all especially for racialized and marginalized communities, and newcomers to Ajax.



## Communication and Messaging

The makerspace must be effectively communicated to the community through the most appropriate channels to reach specific audiences such as social media for teens, multiple language outlets for diverse communities for example. Interview subjects and workshop participants thought that messaging was also critically important – the community must understand what a makerspace is, who can participate and what people can see and do.

## Operations and Staffing

It is assumed the makerspace will be managed and operated by the Ajax Public Library. And assuming it is located within one of the branches it does not necessarily have to maintain the same operating hours as the library. Evening hours for makerspace use are probably more desirable for many than in the mornings and afternoons for example. Perhaps the makerspace opens later in the day and stays open later past library hours on some days. Operating hours using Library staff will vary based on activities and events.

Both interview subjects and workshop participants thought it is critical that the makerspace be staffed with knowledgeable and qualified personnel to facilitate, supervise, and manage. Staff must engage visitors and encourage them to not only use the equipment but assist in teaching them how to use the equipment. It is also important that they are reflective of the broader community of Ajax in which it serves and so it is important that staff include black, Indigenous and/or people of colour.

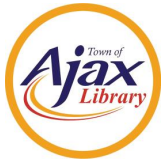
It is anticipated that there will be a wide variety of activities and equipment – both high tech and low tech – in the makerspace. It is not reasonable to assume that staff members will be experts in all these activities and therefore a roster of volunteers and other community members, clubs and organizations could support, develop, and run programs as required or needed.

## Location

General consensus from consultations was that the optimal location for the makerspace was in one of the three branches of the Ajax Public Library. Main branch and Mclean were the most desired choices. Some thought a mobile makerspace was a good idea, but only as secondary facility to a permanent location in one of the branches. Some consideration was given to Town-owned locations in Pickering Village and other locations such as community centres, however, a library branch was still the preferred location.

## Partnership and Sponsorship

Partnerships were considered to be a critical part of the makerspace for programming and service delivery. Departments within the Town of Ajax, Durham District School Boards and higher education institutions, and community and social service agencies and clubs and organizations are all potential partners for the makerspace. Similarly, there are many sponsorship opportunities which would provide both capital and operating funding to the makerspace. Large corporations with a presence in Ajax and local businesses were recommended as possible funders.



## Activities and Equipment

A broad range of activities and equipment were identified through consultation. Everything from robotics, coding kits, 3D printers and audio/video production to sewing machines and woodworking tools was introduced as possibilities for the makerspace. Even kitchens and community gardens were mentioned as potential activity/equipment needs for the makerspace. While makerspaces typically engage in a broad range of activities with a wide variety of equipment to accommodate community interests, the needs and wants of the Ajax community shared through public consultation will be used to select specific activities and equipment.

### 5.3 STAFF SURVEY

In order to better understand the needs and wants of Ajax Public Library staff related to a potential makerspace, a survey was created and distributed to staff members. The survey was open from March 10 – April 1, 2021 and received 58 responses.

#### Key Findings and Summary

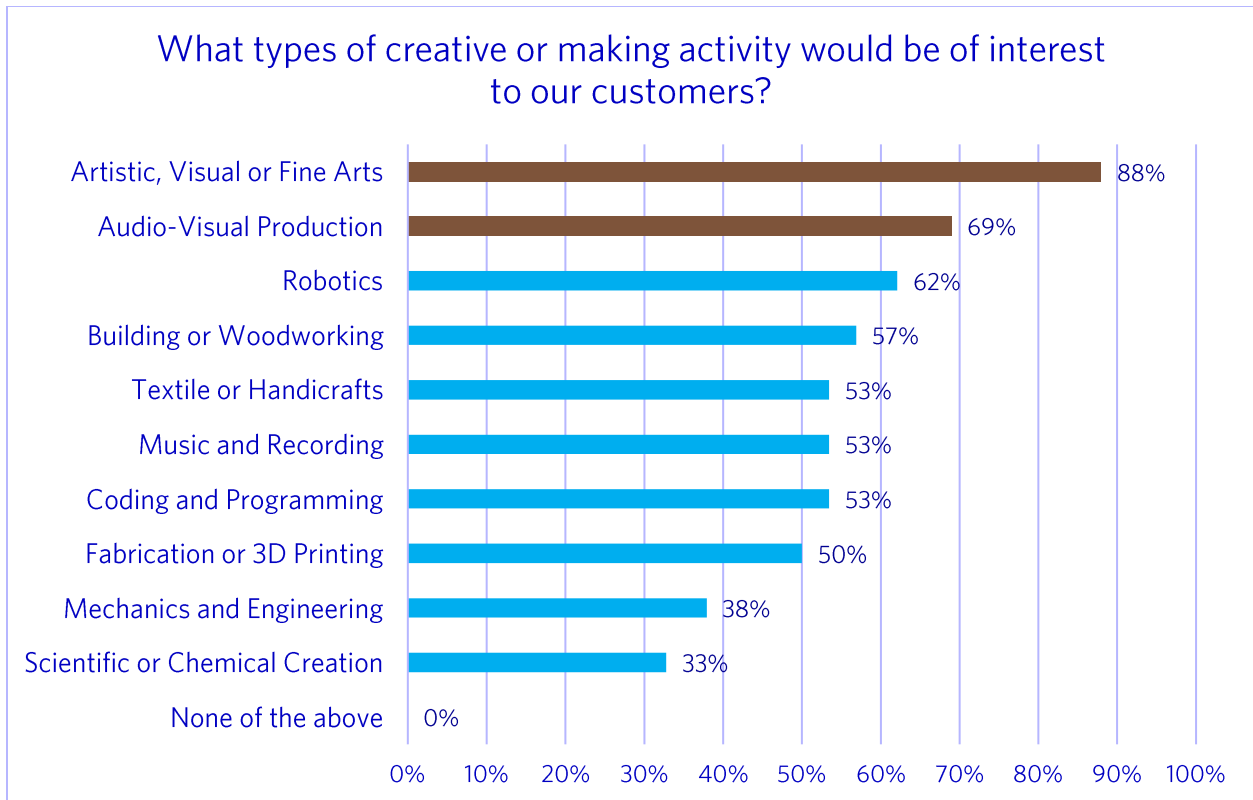
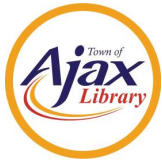
The creative or making activities that staff thought would be of interest **differed slightly** from the activities selected in the public survey. Staff felt that “Artistic, Visual or Fine Arts”, “Building or Woodworking” and “Textile or Handicrafts” would be areas of interest, which was confirmed by the public survey. The **greatest disparity** between the activities that staff thought would be of interest to patrons, and the activities patrons selected was “Audio-Visual Production”, where 69% of staff selected it, but only 35% of public survey participants selected it. Another disparity came in “Robotics”, which staff felt would be more of interest than reported on the public survey.

Similar to the public survey, “Within one of the existing Ajax Public Library branches” was the location most staff respondents preferred. Themes in the open-ended barriers to usage question mostly mirrored those in the public survey (location, cost), with the staff also including **lack of awareness as an additional barrier**. This indicates that makerspace activities should be free to the public whenever possible and should be well publicized to increase use.

Based on quantitative and qualitative responses, staff are acutely aware of the need for guidance that Makerspace customers may experience. However, only 35% of staff reported they have a skill or talent that would make them a good fit for staffing a makerspace, indicating a **possible need for training or hiring**.

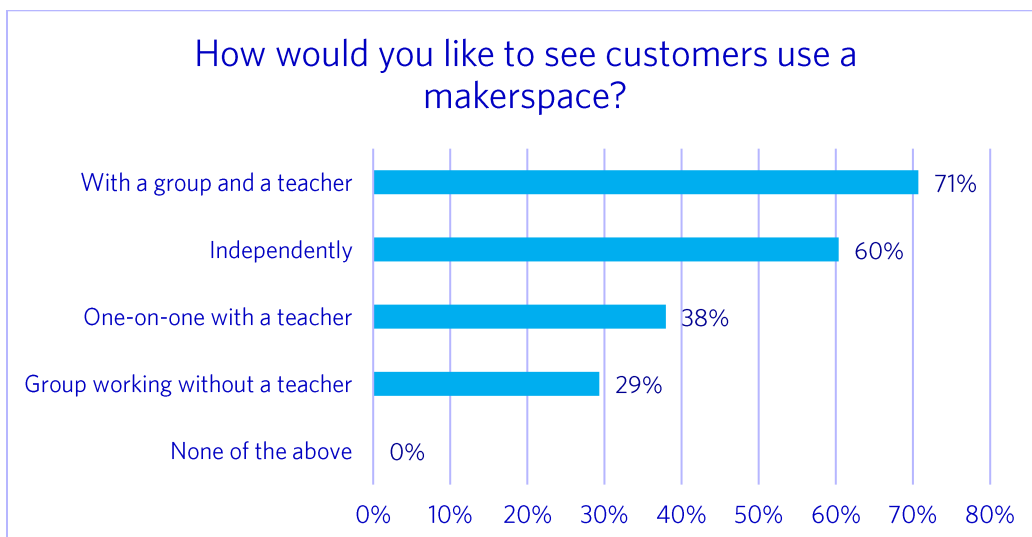
#### Makerspace Activities

Staff were asked to select all the activities they thought would be of interest to customers. Respondents most frequently selected the following: Artistic, Visual or Fine Arts (88%); Audio-Visual Production (69%); Robotics (62%). Less frequently selected were: Mechanics and Engineering (38%); Scientific or Chemical Creation (33%).

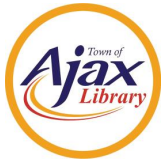


### Makerspace Experience

When asked how they would like to see customers use a makerspace, 71% selected “With a group and a teacher” and 60% selected “independently”. These responses were aligned with responses received to the public survey (see section ???).

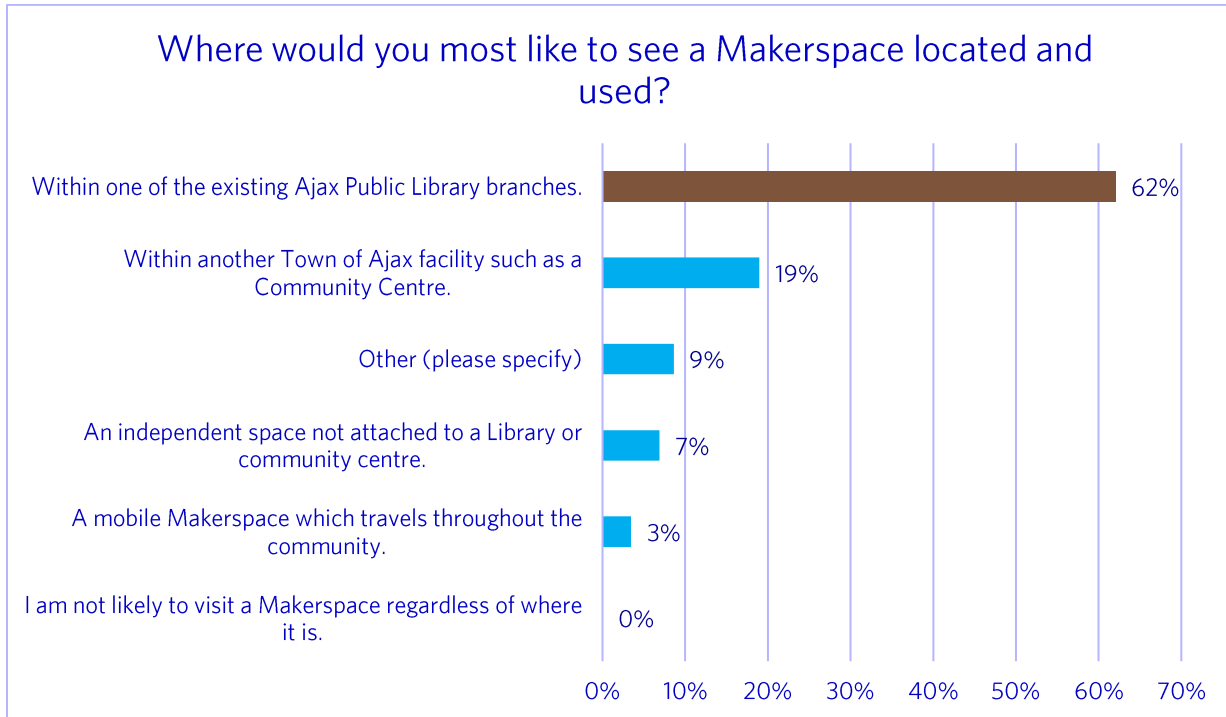






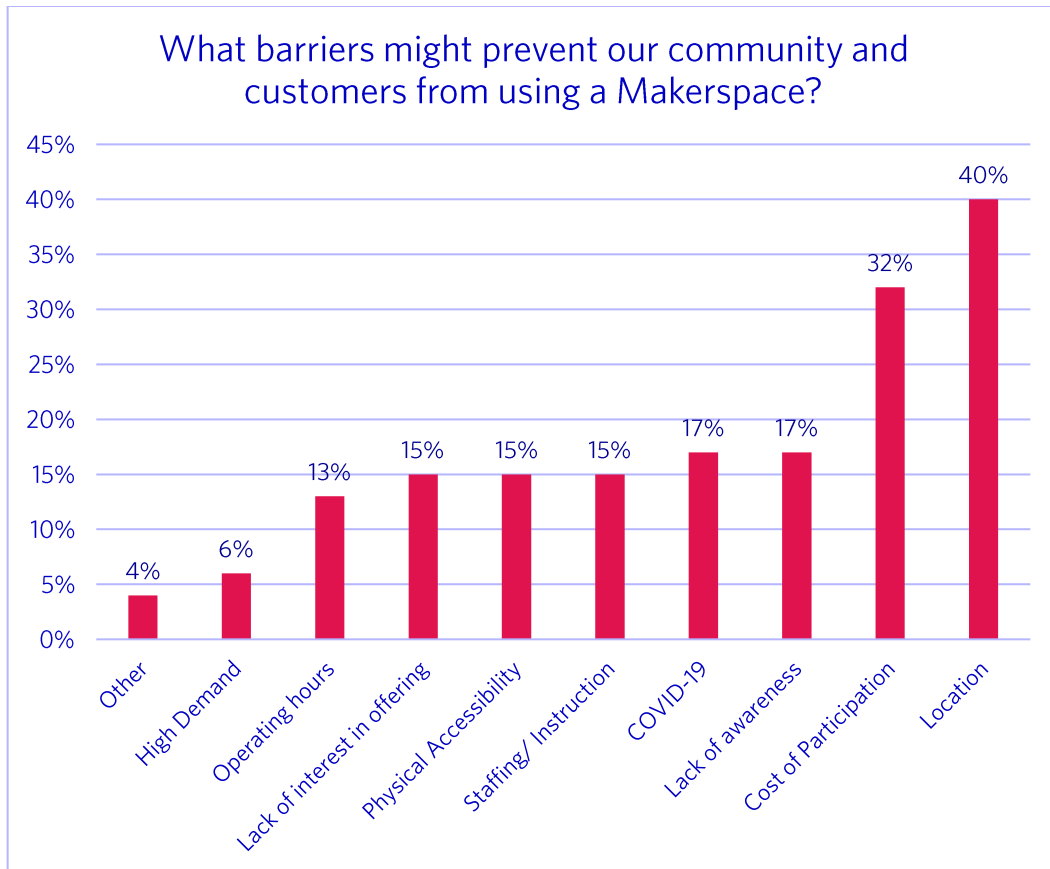
### Makerspace Location

When asked where they would most like to see a Makerspace located, 62% of respondents selected “Within one of the existing Ajax Public Library branches”. Of those who selected “Other (please specify)”, a majority of responses indicated the Old Village Library space as a possible site.



### Barriers to Usage

Respondents were asked an open-ended question about what barriers might prevent community and customers from using a makerspace. 40% of answers referred to the **location** of the space, while 32% of responses cited **cost** as a possible barrier. 17% of answers described a **lack of awareness** from community or customers as a possible barrier, and 17% also cited concerns related to the **COVID-19 pandemic**. Answers included:



### Makerspace Staffing

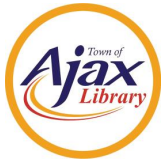
Respondents were asked if they had a skill or talent that would make them a good fit for helping to staff a makerspace. 35% selected “Yes”.

### Staff Suggestions

Respondents were asked an open-ended question about the activities, equipment, or elements they would recommend Ajax consider based on other makerspaces they have visited, used or read about.

Answers varied widely, but many recommended a **combination of high-tech and low-tech equipment**. Another theme emerged around the **instruction and information provided**. Other answers described the **physical space**. Staff responses also noted the importance of a **robust, easy to use sign-up system** for both makerspace users and staff members. Many specifically described **Audio/Visual production resources** such as sound booths and video equipment.

Staff were asked if they had any other comments in an open-ended question. Most answers expressed enthusiasm for a potential makerspace.



## 5.4 PUBLIC SURVEY

In order to better understand the specific needs and wants of the Ajax community, a survey regarding a potential makerspace was created and distributed through Ajax Public Library channels including social media, email, partner links, and the Ajax Public Library website. The survey was open from March 10 – April 1, 2021 and received 704 responses. Email newsletter was the most popular collection method.

### Key Findings and Summary

Overall, respondents were **very enthusiastic and supportive** of the idea of an Ajax Public Library Makerspace. Only 2% said they were not interested, regardless of location, and 40% said they would be interested and able to volunteer.

Survey respondents were most interested in using a makerspace to pursue leisure and learning. The types of makerspace activities respondents reported being interested in were correlated to the types of hobbies respondents reported having. Respondents indicated a desire for instruction or guidance within the makerspace, both selecting “with a group and a teacher” as the most desired makerspace experience, and citing lack of instruction or poor instruction as a key barrier to use

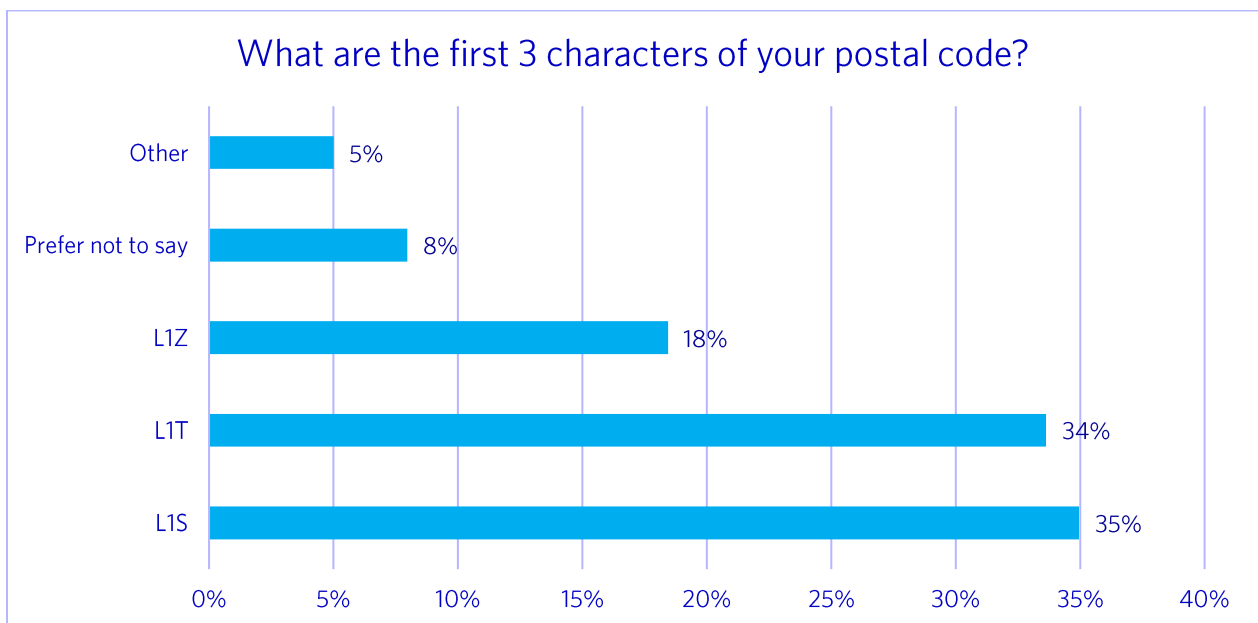
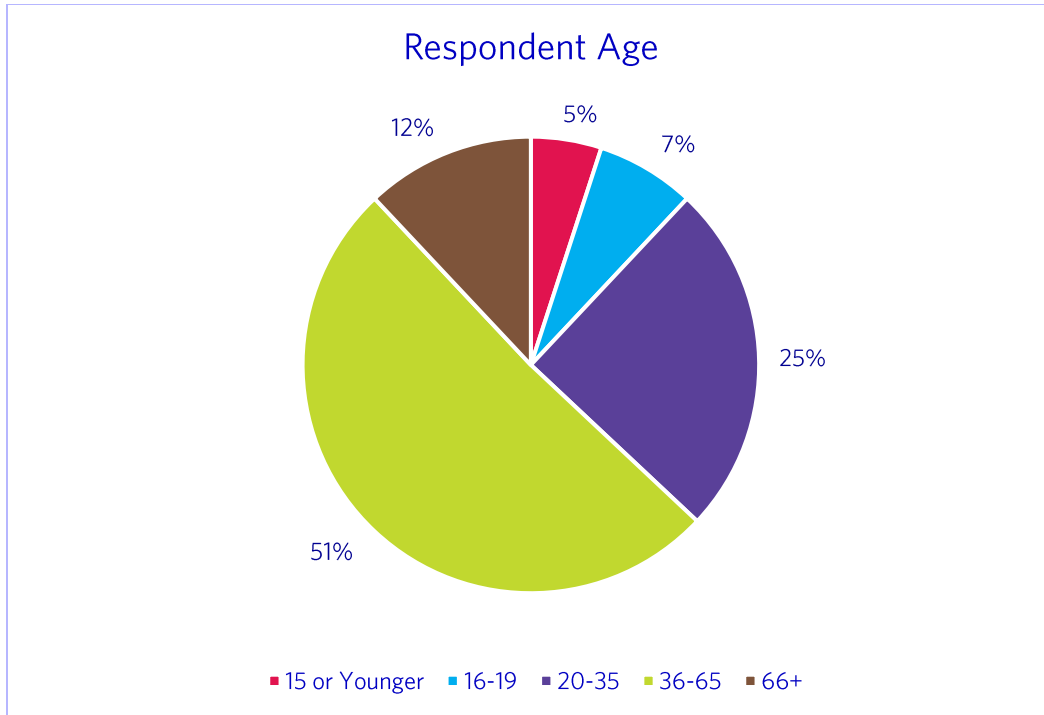
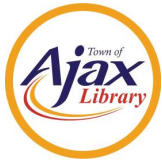
Limited hours and lack of availability were both frequently cited barriers to access, indicating that the makerspace should have operating hours that matches the needs of its target audience. Many respondents described weekend availability as being important to them. The location of the makerspace is important to potential users, with it being the second most frequently described barrier to usage. Within an Ajax Public Library branch was the overwhelming preference for location, which did not change for less frequent library users.

### Participant Information

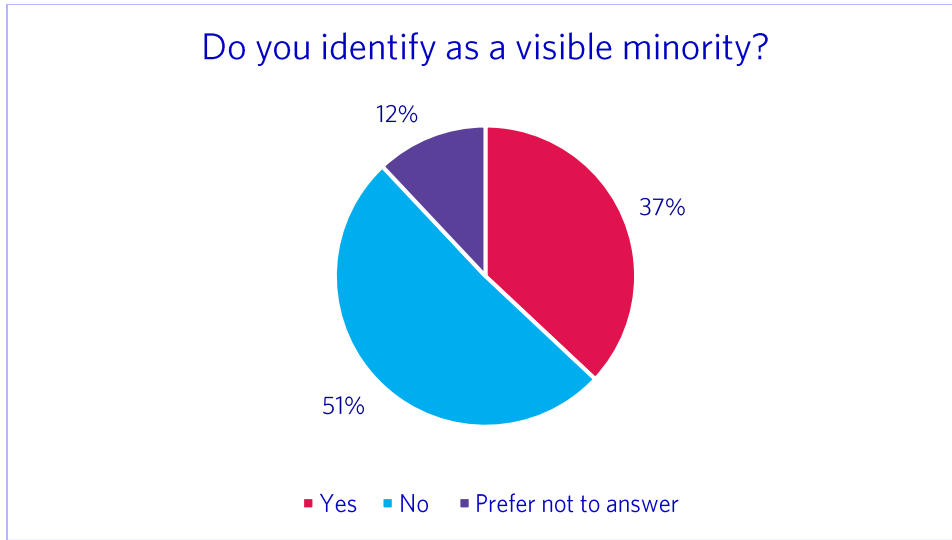
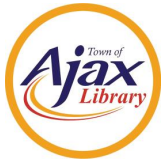
The majority of survey respondents (51%) were between the ages of 36-65.

37% identified as a visible minority, with 52% not identifying as a visible minority and 12% preferring not to answer.

35% of respondents reported living in postal code L1S (Main Branch), 34% reported living in postal code L1T (McLean Branch), and 18% reported living in postal code L1Z (Audley Branch). 8% selected “other” or “prefer not to say”

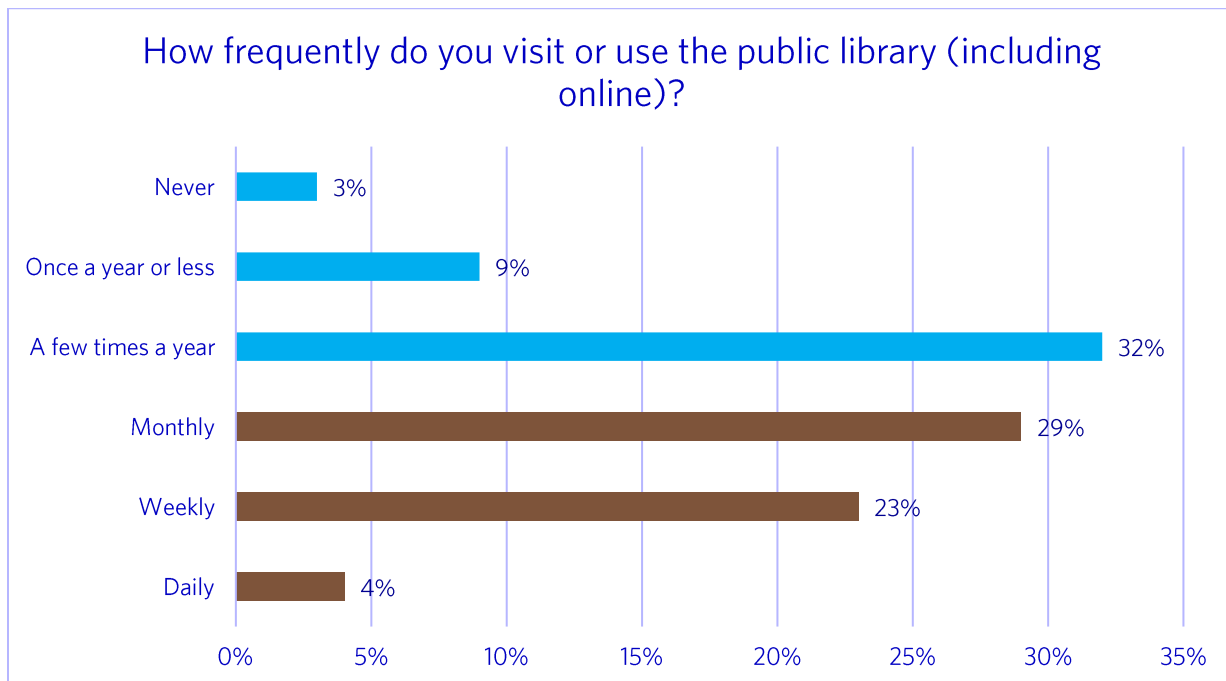






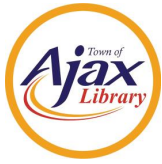
### Library Usage

Most respondents were frequent library users, with 56% reporting they used the library at least monthly.



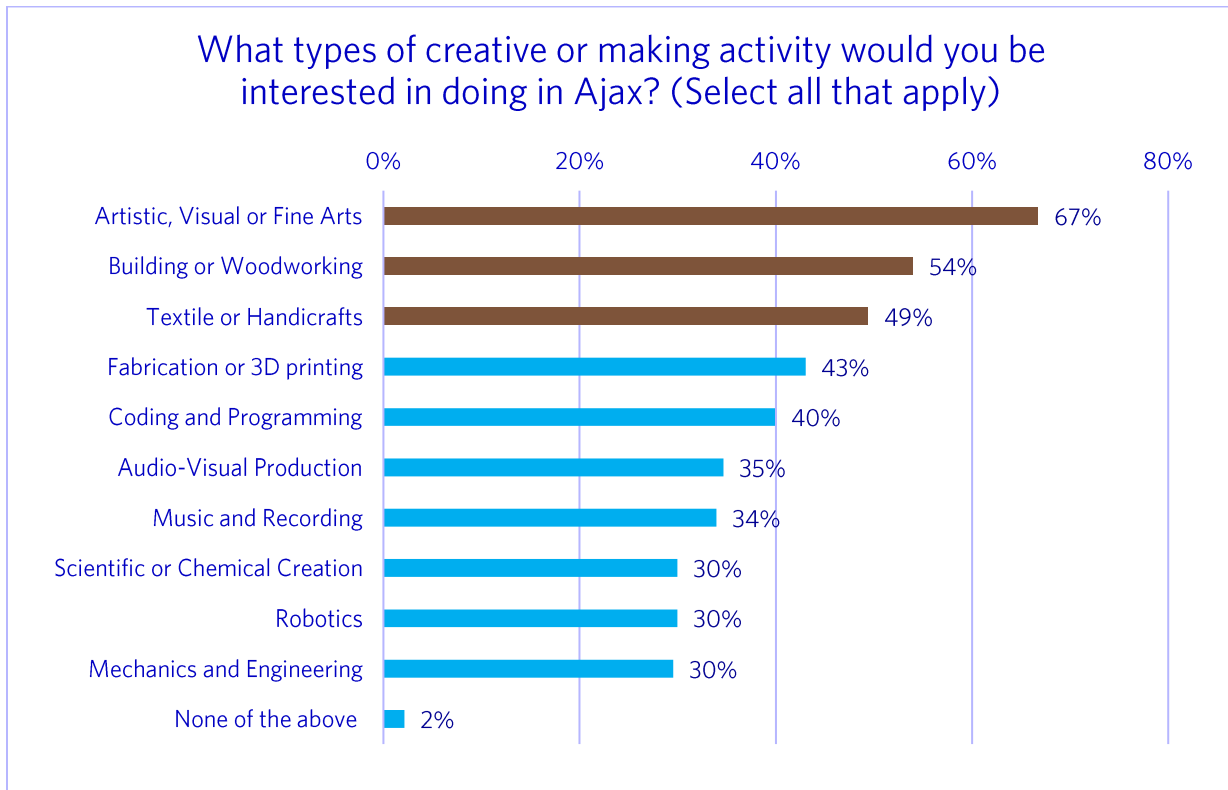
### Makerspace Activities

When asked what types of activities they would be interested in doing, the most frequently selected response was “Artistic, Visual or Fine Arts” (67%).



Other frequently selected responses were “Building or Woodworking” (54%) and “Textile or Handicrafts” (49%).

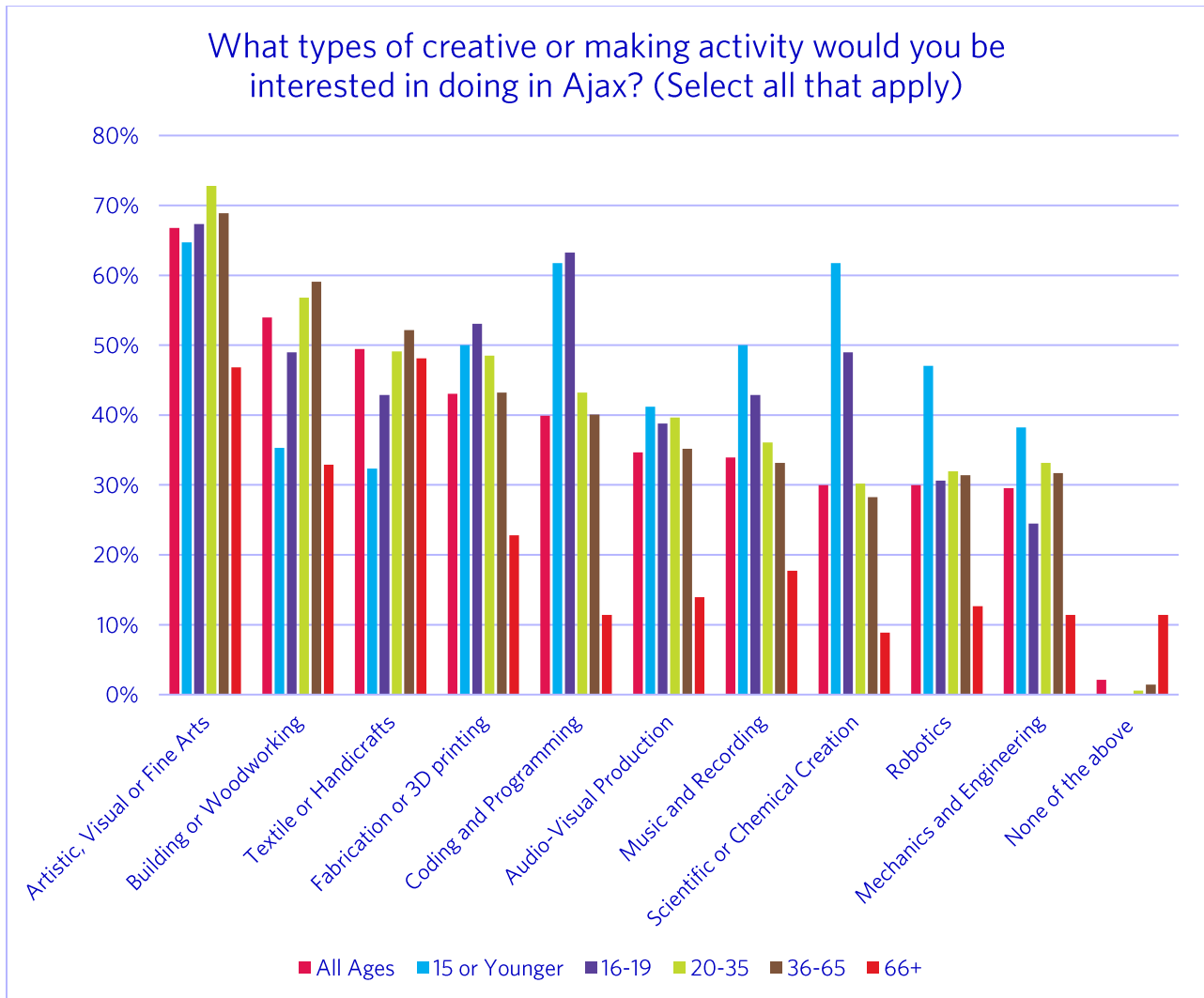
Less frequently selected were “Robotics” (30%), “Mechanics and Engineering” (30%) and “None of the above” (2%).



Preference for specific activities was examined relative to age group. Younger respondents (age groups 15 or Younger and 16-19) were most interested in: Artistic, Visual or Fine Arts, Coding and Programming, Scientific or Chemical Creation, and Fabrication or 3D printing. Younger respondents (age groups 15 or Younger and 16-19) were least interested in: Textile or Handicrafts, Building or Woodworking, and Audio-Visual Production.

Older respondents (age groups 36-65 and 65+) were most interested in: Artistic, Visual or Fine Arts, Building or Woodworking, Textile or Handicrafts. Older respondents (age groups 36-65 and 65+) were least interested in: Scientific or Chemical Creation, Coding and Programming, Mechanics and Engineering, and Robotics.

Younger respondents (age groups 15 or Younger and 16-19) expressed a stronger than average interest in: Fabrication or 3D printing, Coding and Programming, Music and Recording, Scientific or Chemical Creation, Robotics, and Mechanics and Engineering. Younger respondents (age groups 15 or Younger and 16-19) expressed a weaker than average interest in: Building or Woodworking and Textile or Handicrafts.

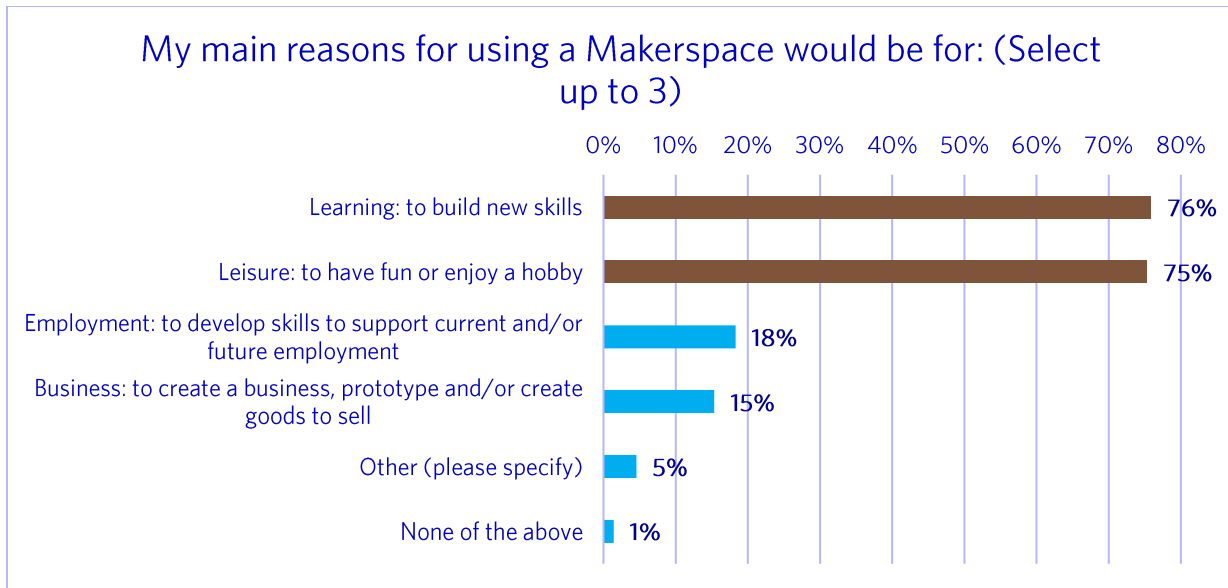
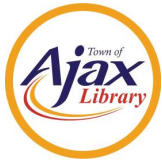


### Makerspace Activities

When asked to select their main reasons for using a makerspace, the most frequently selected responses were: Learning: to build new skills (76%); and Leisure: to have fun or enjoy a hobby (75%).

Less Frequently selected were: Employment: to develop skills to support current and/or future employment (18%); and Business: to create a business, prototype and/or create goods to sell (15%)

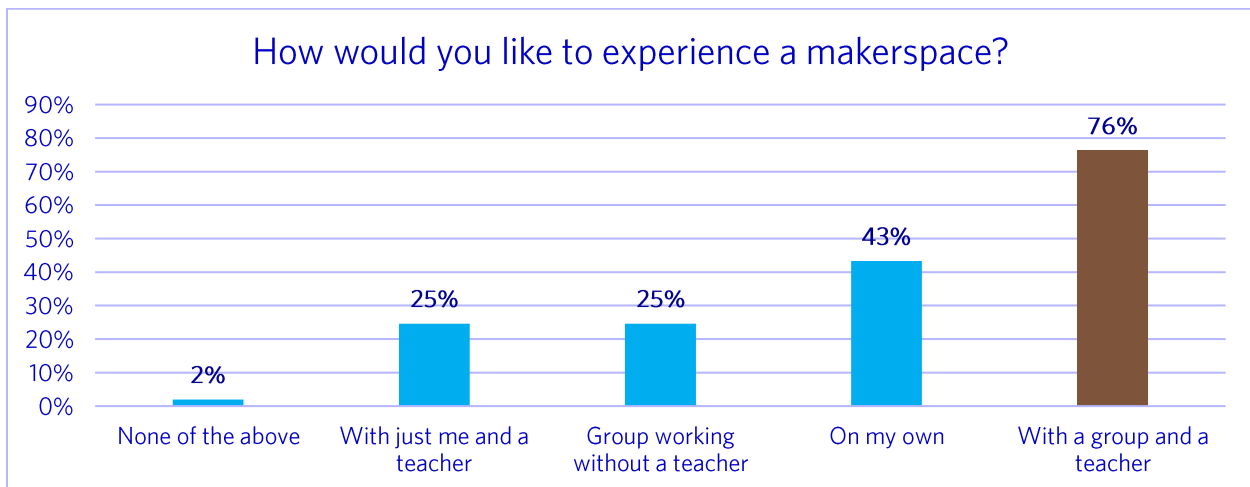
Of those who selected "Other" (5%), around half of replies (51%) referenced being social or sharing the space with others.



### Makerspace Experience

When asked to select all the ways they would like to experience a makerspace, 76% selected “With a group and a teacher” and 43% selected “On my own”. Less frequently selected were “With just me and a teacher” (25%) and “Group working without a teacher” (25%)

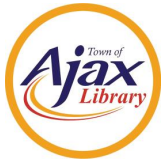
This indicates that most respondents are seeking a mix of guided group experience, as well as independent use time.



### Barriers to Usage

Respondents were also asked an open-ended question about what would make them less likely to use a makerspace. A large portion of respondents (20%) cited **limited hours or timing** related challenges, with responses such as:





*“Not knowing when it was open or available or having to “jump through hoops” to be able to book a time; limited windows of availability”*

Another frequently cited concern was the **location of the space** (19%). Respondents also cited a space that was **too busy or crowded** as a significant barrier (19%). Responses included:

*“Too crowded, large groups in classes”*

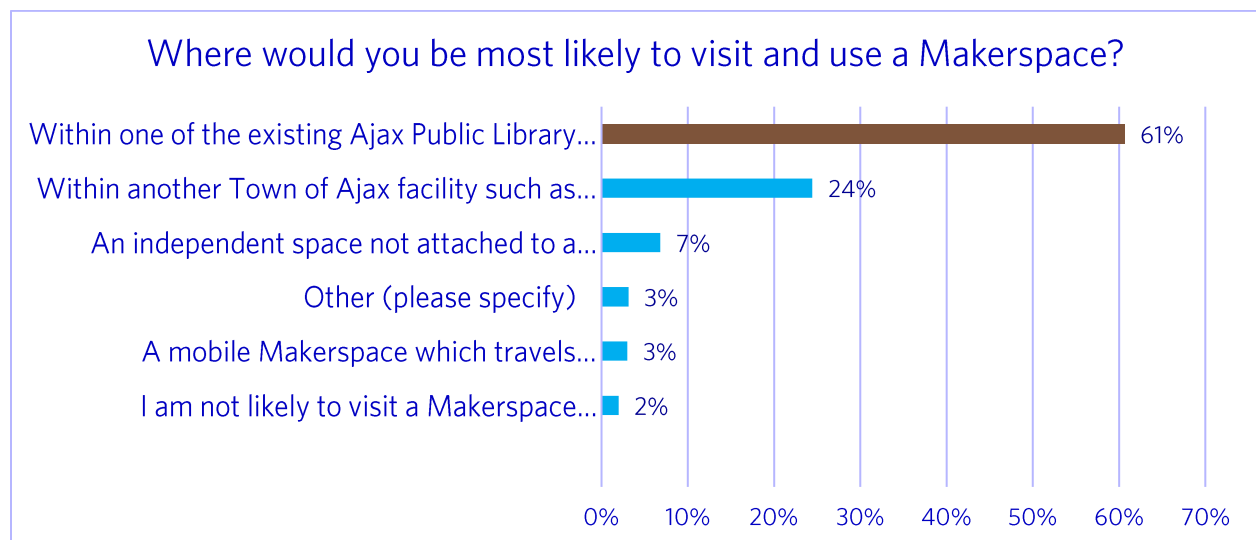
*“Crammed facilities, too many people at one time”*

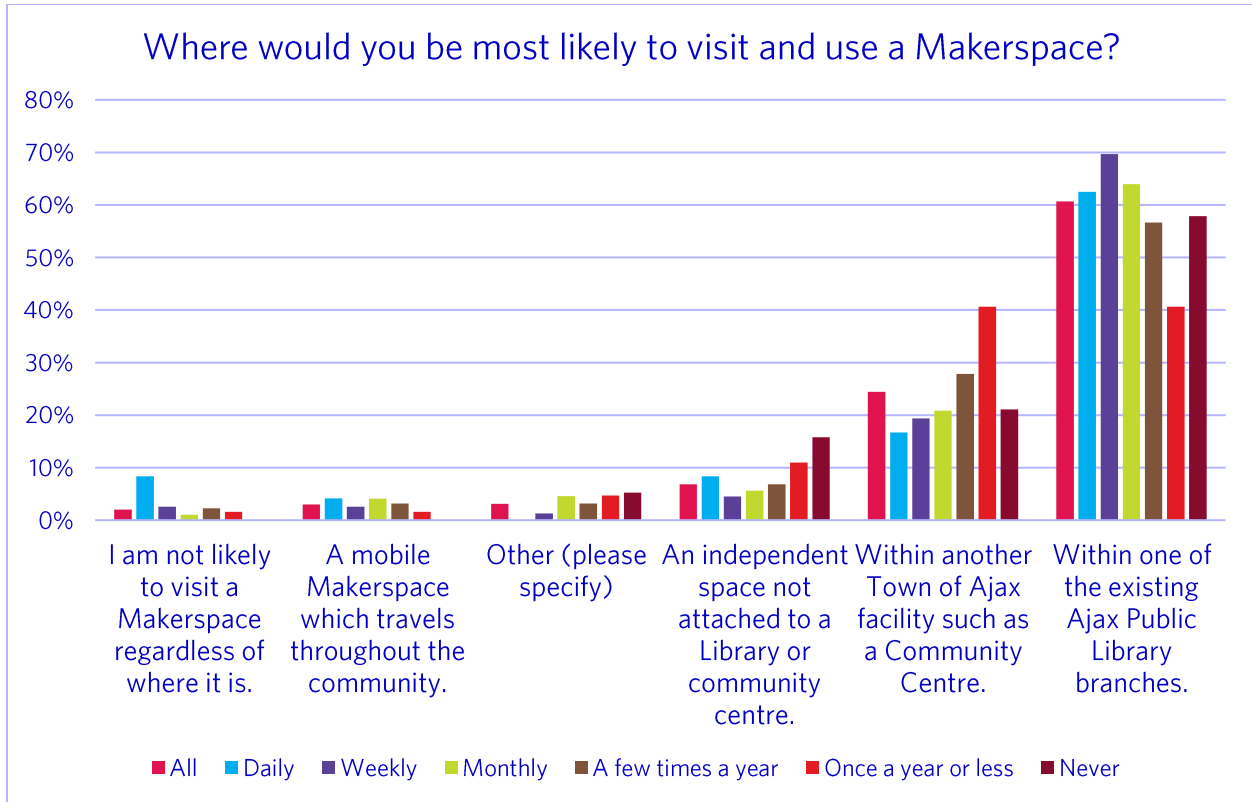
Other frequently cited barriers to use included high cost or expensive to use (17%), a lack of interest in the activities offered (10%), lack of instruction or poor instruction (7%), and the space being dirty, noisy, or disorganized (6%).

### Makerspace Location

When asked where they would be most likely to visit and use a makerspace, the most widely selected answer (61%) was “Within one of the existing Ajax Public Library branches”

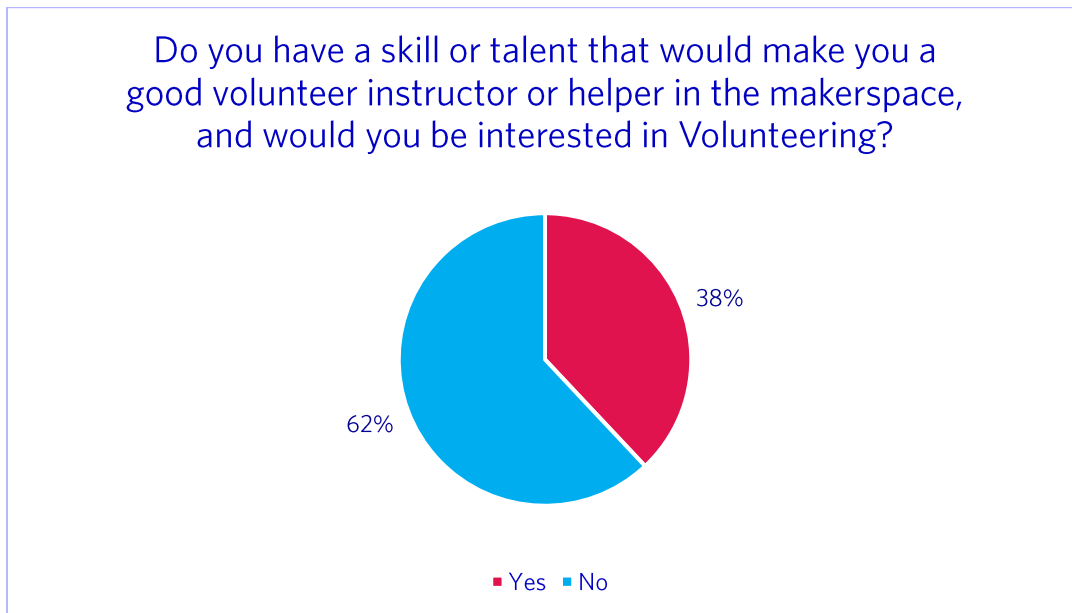
Preferred location was compared to frequency of library usage. Infrequent users (those who used the library less than once a year or never) were slightly less likely than frequent users to prefer a makerspace in an existing Ajax Public Library branch, but it was still their overall preferred location





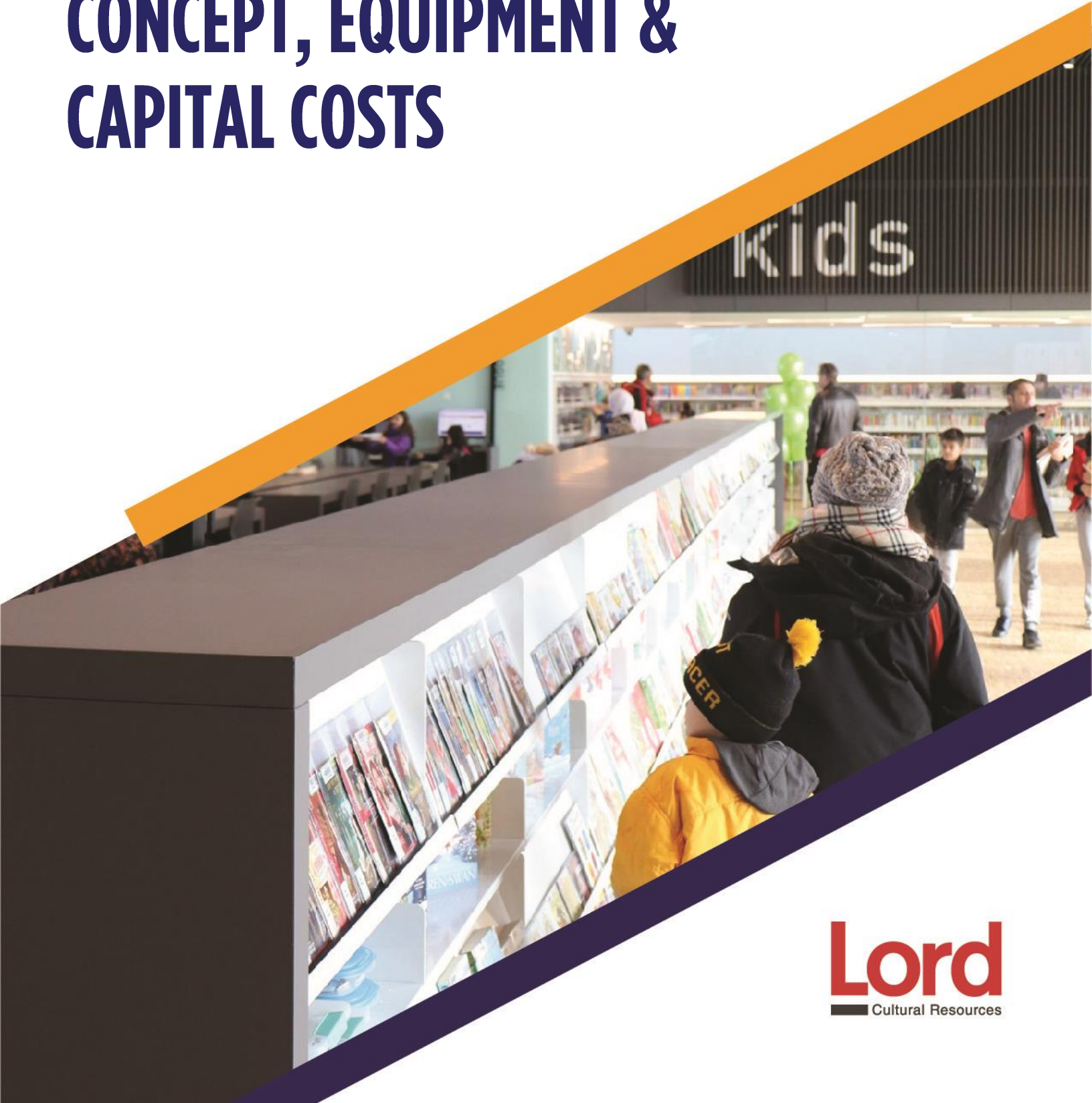
## Volunteering

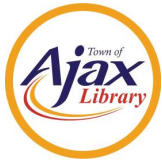
When asked if they had a skill or talent that would make them a good volunteer, and if they would be interested in participating, 38% of respondents selected “yes”.



## SECTION 06

# LOCATION & SPACE ALLOCATION, CONCEPT, EQUIPMENT & CAPITAL COSTS





## 6. LOCATION AND SPACE, CONCEPT, EQUIPMENT, AND CAPITAL COSTS

Based on case studies, market analysis, consultation with the community and stakeholder and ongoing communication with the library senior management a concept has been developed for the makerspace in Ajax. Additionally, the study identifies three potential locations with associated capital costs to fit out the spaces and a proposed equipment and furniture list that is common to all three locations.

### 6.1 LOCATION AND SPACE

19 potential makerspace locations had been assessed for this study. These locations included all three Ajax Public Library branches and Town of Ajax-owned properties throughout the town including recreation and community centres and other properties that had the potential for adaptive re-use.

Our evaluation criteria for selection were as follows:

- Walkability, Transit Accessibility, Bike Accessibility
- Existing population and projected growth and demographics
- Stakeholder and public preference
- Familiarity of space to target audience
- Mutual benefits (increased visitation to locations, ability to cross-program)
- Ease of transformation and retrofitting
- Proximity to existing library staff

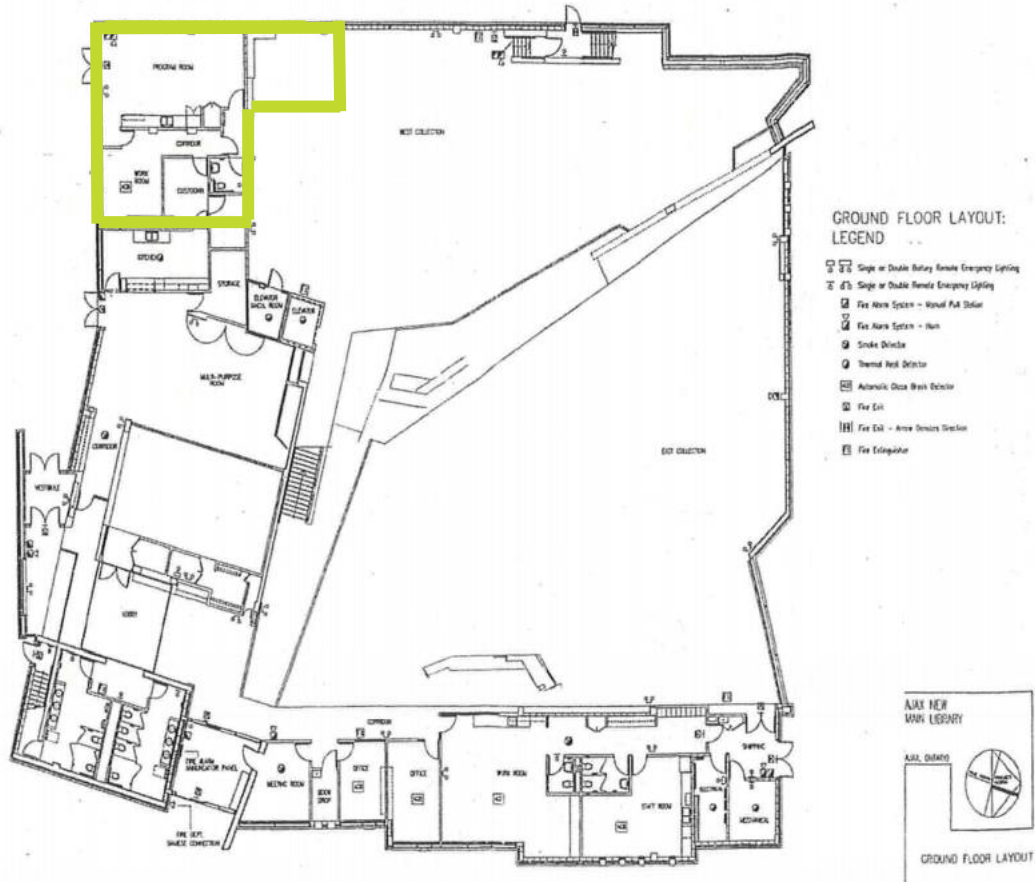
After evaluating the potential locations, and with overwhelming preference by the public and stakeholders, the optimal site for the makerspace should be in one of the three Ajax Public Library branches. Further site tours were conducted for the three branches, and it was determined that either Main Branch or McLean would be most suitable for the makerspace.

Given the recent completion of the Audley branch, its open concept and lack of ancillary spaces that could be repurposed, it did not seem reasonable both from a construction and cost perspective to try and create new space for the makerspace at this branch at this time.

#### Main Branch

Although Main branch did not have defined space, the Library senior management team thought it possible to reconfigure the children's area and a few offices on the main floor as one possibility and the second level stacks area by the elevator as another as delineated in the plans below.

Main Branch – Main Level

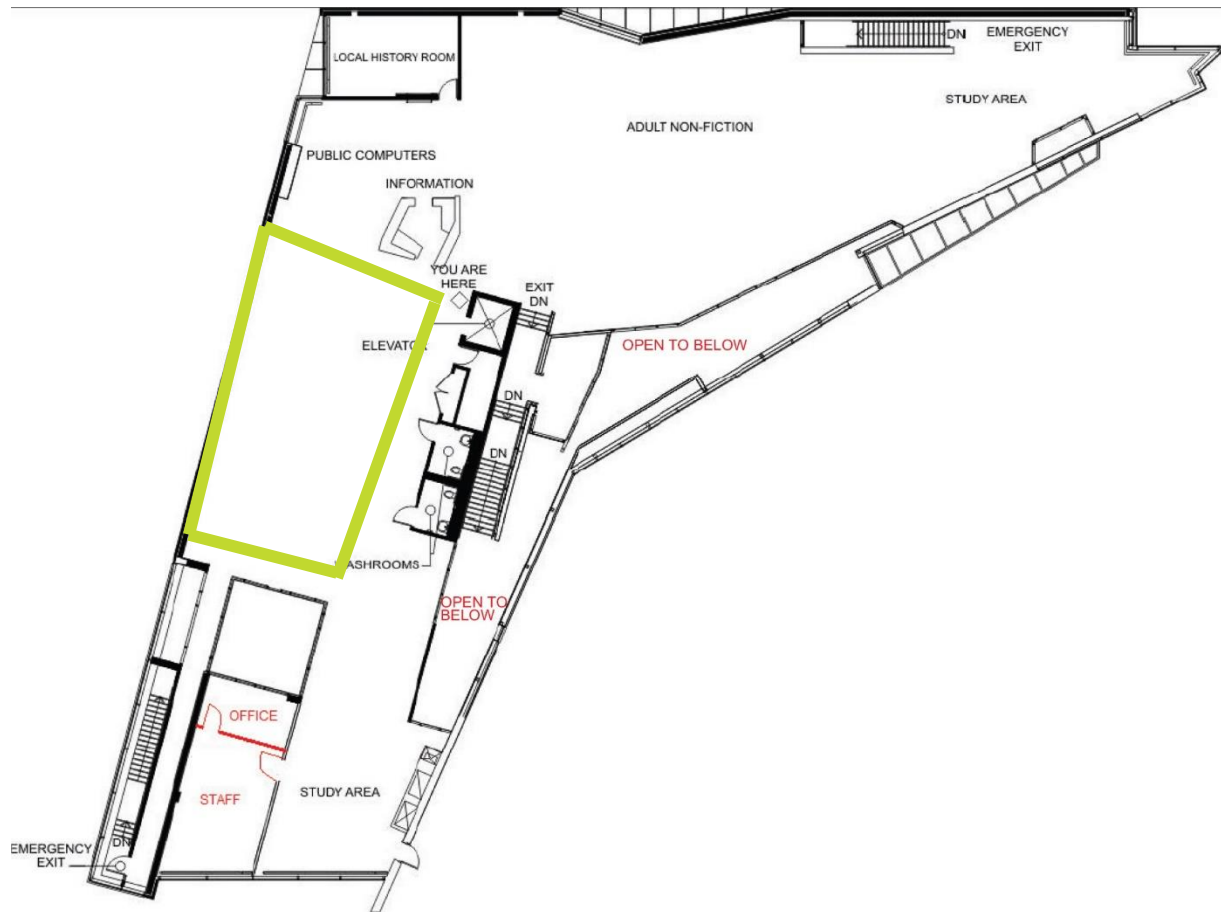


Main Branch - Main Floor Highlights

- Approximately 930 sq.ft. as outlined in green. The space could be expanded.
- The space would occupy part of the children’s area and some staff offices.
- Existing dedicated entrance outside library courtyard
- Good street visibility



## Main Branch – Second Level



### Main Branch – Second Level Highlights

- Approximately 1,160 sq. ft. as outlined. Could be expanded.
- Located in current stacks area which could be relocated.
- Located adjacent to elevator with close proximity to second level washrooms.

### Main Branch Comments

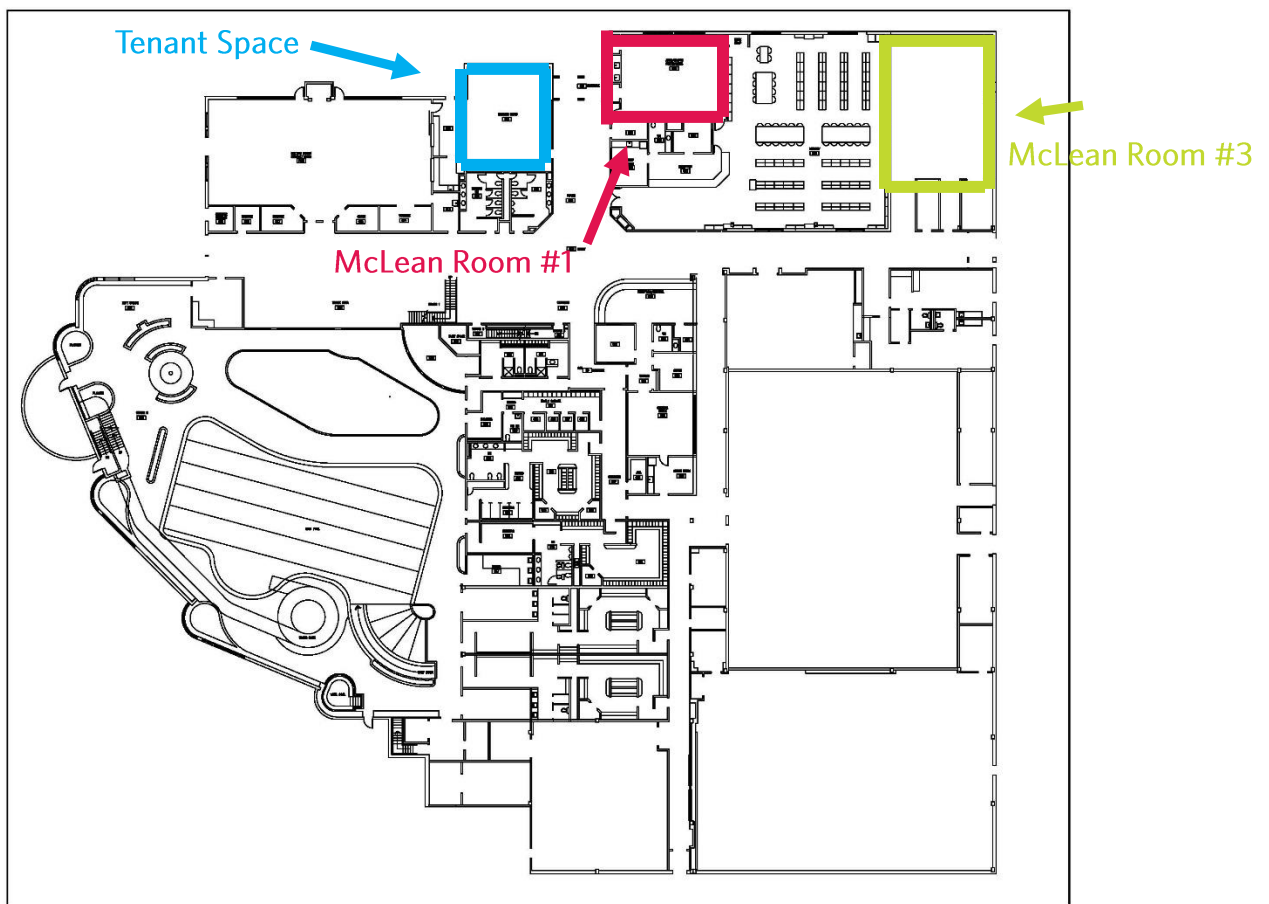
- Main floor has direct access to outside and therefore not dependent on main library being open
- Second level does not have direct access to outside, more dependent on library operating hours.
- Relocation of stacks on second level may prove to be more difficult.

**Conclusion:** Only main floor location will get costed. Second level will not be considered for makerspace.

## McLean Branch

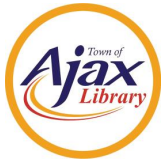
McLean Branch and Community Centre would serve as a good location for the makerspace as there are three existing spaces – two of which are community rooms (one currently used by the library) and one that is leased to third party tenant- that would require less work to retrofit than those at Main Branch. The makerspace at the McLean location would also benefit from the user base and activity of the community centre. The three spaces initially under consideration for the makerspace are technically within community but adjacent to or in close proximity to the library all within the same complex. The three spaces for consideration at McLean are highlighted below.

### McLean Branch – Tenant Space, McLean Room #1, McLean Room #3



### McLean Branch – Tenant Space Highlights

- Approximately 975 sq. ft. as outlined. Not easily expandable space. Could combine with McLean Room #1.
- An existing tenanted space within the community centre opposite the library.
- Access from the community centre main entrance.



### McLean Branch – McLean Room #1 Highlights

- Approximately 918 sq. ft. as outlined. Could be expanded into the library or possibly combined with tenant space.
- An existing community use room that the library is currently occupying.
- Access from within the library and from community centre main entrance.

### McLean Branch – McLean Room #3 Highlights

- Approximately 1,400 sq. ft. as outlined. Could be expanded into adjacent library if necessary.
- An existing community use room.
- Potential access from within the library.
- Has direct outdoor access.

### McLean Branch Comments

- Tenant space not easily expandible.
- Tenant space not directly connected to library.

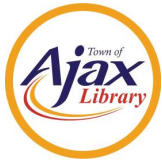
Final Conclusion: Only McLean Rooms #1 and #3 will be costed. Tenant space will not be considered for makerspace.

## 6.2 CONCEPT

The Ajax Makerspace will be a community-based program, collaborative and creative workplace. It will be an inclusive and accessible space where residents of all ages, backgrounds and abilities will be able to experiment, explore, ideate and create.

The Makerspace will be physically located in one of the three Ajax Public Library (APL) branches and will be operated, managed and staffed by the APL. It will provide free-of-charge access to hands-on tools, instruments, machines and equipment – both low tech and high tech – in a safe and welcoming environment. Additionally, the Makerspace will offer structured and informal learning opportunities including specific classes, workshops and tutorials.

The makerspace will be open and accessible to all residents of Ajax regardless of age, background and ability. The primary goals of the makerspace are to foster creativity and innovation, support skill development and provide opportunities for life-long learning. The Ajax Makerspace is conceived as one space located in one Ajax Public Library location. If both demand and need warrant it, the Library could look to either increase in size (if feasible) or expand to include to other locations in Ajax.



## 6.3 TARGET AUDIENCE

The intent of the Ajax Makerspace is that it will be available, open and accessible to all residents. The majority of those consulted suggested the Makerspace should be multi-generational – a space that would appeal to most age groups from youth to seniors.

There are makerspaces designed for children K-5. They are typically distinct spaces with age-appropriate supplies and equipment, not compatible with tools and equipment for teenagers and adults. A separate children’s makerspace is not envisioned for the Ajax Public Library at this time.

While the Ajax Makerspace is intended to be multi-generational, the primary target audience will be youth (ages 10-12), teenagers (ages 13-19), and young adults (ages 20-24). That is, the equipment and tools as well as the programs and services will cater to this age cohort. Makerspaces are informal learning environments that allow youth and teenagers to be creative and innovative without judgment.

Makerspaces are particularly important to newcomer families and to the marginalized and racialized communities in Ajax as they provide access to not only tools and equipment but to opportunities to help forge their futures. A key benefit of the makerspace is to foster entrepreneurship and create opportunities for skill development and future employment amongst teens and young adults.

## 6.4 USER EXPERIENCE

The user experience is based on consultation with the Ajax community, community partners, stakeholders, teen advisory, library staff and library senior management. It reflects what the majority of residents wanted to see and do, wanted to experiment with and in many cases try for the first in the makerspace. These experiences are organized as three distinct areas:

1. Make Zone
2. Think Zone
3. Create Zones – within the create are:
  - Crafts and Fabric Arts
  - Digital Innovation
  - Coding, Circuitry and Robotics
  - Media Lab



Edmonton Public Library Makerspace

### Make Zone

The Make Zone is the area in the Makerspace where many of the ideas conceived and developed come to life physically. The Make Zone will be the space for 3D printers, vinyl cutters, bookbinding and materials for model making.



### Think Zone

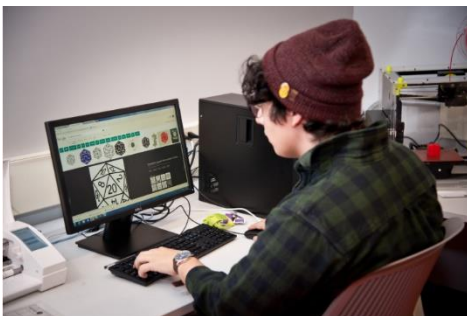
The four areas of the Create Zone revolve around a centralized collaborative work area called the Think Zone. This zone features comfortable, lounge seating and moveable work surfaces that can facilitate group activities. The zone would also include whiteboards and pin up boards to demonstrate and showcase ideas.



### Create Zones

#### Craft and Fabric Arts

This area features the tools and equipment required to create and make in textiles and fabric. Sewing machines, sergers and embroidery machines will be available for beginners and more advanced sewers. This area will also include button makers, heat transfers and fabric cutters.

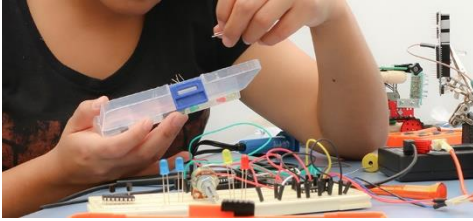


Brampton Public Library Makerspace

#### Digital Innovation

The Digital Innovation area will include a bank of powerful computer workstations loaded with free and licensed software for a variety of applications. Users will be able to create musical compositions, edit sound and video and design games. AutoCAD and other similar software will allow users to design objects, clothing and even buildings.





### Coding Circuitry and Robotics

Electronics kits and components for building simple circuits, machines, computer motherboards, and robotics will be located in this area. These tools and equipment are found in most makerspaces today. Common kits include Arduino, MaKey MaKey, Raspberry Pi and others.



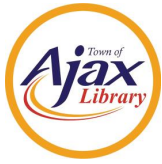
*Inspiration Lab, Vancouver Public Library*

### Media Lab

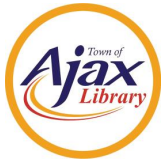
The Media Lab will allow users to access a production studio for projects involving video production and photography. The space will facilitate content production and will include cameras, lighting equipment, backdrops and green screens and microphones and sound capture devices.

## 6.5 EQUIPMENT

Based on consultation with other makerspace operators, feedback from stakeholders and the community, discussion with industry experts, and independent research, an equipment list was developed. The equipment list focuses on larger capital expenditures of equipment and tools, but also includes some recurring supplies that may be highly specific or not commonly available to users. Readily available recurring supplies (fabric, scrapbooking paper, writing utensils) are not included in this list. Below is a summary of costs, divided by area and activity.



Area	Activity	Estimated Cost
Craft and Fabric Arts	Sewing and Embroidery	\$ 4,500.00
	Button Making	\$ 500.00
	Heat Transfer	\$ 1,000.00
	Scrapbooking and Zine Making	\$ 1,000.00
	Furniture	\$ 8,000.00
	Total Area Cost	\$ 15,000.00
Digital Innovation	Computing	\$ 15,000.00
	Virtual Reality	\$ 2,000.00
	Furniture	\$ 12,000.00
	Total Area Cost	\$ 29,000.00
Coding, Circuitry, and Robotics	Programming and Robotics (LEGO Mindstorms)	\$ 8,000.00
	Programming and Robotics (Various)	\$ 13,000.00
	Circuitry & Electronics	\$ 500.00
	Furniture	\$ 12,000.00
	Total Area Cost	\$ 33,500.00
Media Lab	Photo and Video Recording	\$ 17,000.00
	Photo and Video Editing	\$ 1,000.00
	Music Recording and Editing	\$ 9,000.00
	Furniture	\$ 2,000.00
	Total Area Cost	\$ 29,000.00
Make Zone	3D Printing	\$ 3,500.00
	Laser Cutter and Printer	\$ 5,000.00
	Large-format Printing	\$ 1,000.00
	Vinyl Cutting	\$ 3,500.00
	Furniture	\$ 2,000.00
	Total Area Cost	\$ 15,000.00
Think Zone	Furniture	\$ 18,500.00
	Total Area Cost	\$ 18,500.00
<b>Estimated Equipment and Supplies Cost</b>		<b>\$ 140,000.00</b>



## 6.6 CAPITAL COST

The Order of Magnitude Order (Class D) estimates were prepared by a 3<sup>rd</sup> party cost estimator (A.W. Hooker) to establish a realistic estimate of the hard construction costs as well as soft costs for each of the space scenarios at the two branch locations below.

1. Main Branch - Main Level
2. McLean Branch - McLean Room #1 with extension
3. McLean Branch - Mclean Room #1 without extension
4. McLean Branch - Mclean Room #3

The Order of Magnitude (Class D) estimates were based on the assumptions and the high level of design information provided to the estimators. The accuracy of the estimate (Class D) is intended to be +/-25%. Estimates become more accurate and higher class categories (i.e. Class A, B, C) as more design information is provided such as schematic and construction drawings. The accuracy is based on the definition for Estimate Classifications outlined in the *Guide to Cost Predictability in Construction* prepared by the Joint Federal Government & an Industry Cost Predictability Taskforce. A full elemental breakdown of costs are included in Appendix C.

## 6.7 MAIN BRANCH – MAIN LEVEL

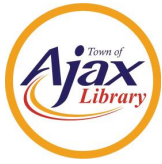
### Space Layout



### Base Assumptions

The following are assumptions for construction to inform cost estimates ( furniture and equipment is included in separate equipment and furniture list in previous section 6.3):

- Space size – 920 sq.ft.;
- Retain existing washroom and server room as highlighted in gray;
- Demolition of existing janitor room;
- Relocation of janitor (elsewhere in the building, preferably on the main floor);
- Cap waterline where kitchen counter removed;
- Create new door opening to existing washroom, from library;



- Infill existing door opening where single door removed;
- Demolition of partition wall between children’s play room and library to extend space;
- Creation of new demising walls to create Media Zone as highlighted in green;
- Concrete block partition to library side, gypsum board partition to makerspace side;
- Furring to concrete block partition;
- Demolition of existing drywall ceiling, retain exposed ceiling;
- Resilient sheet flooring throughout;
- Allowance to repair existing floor where existing partitions removed;
- Paint finish to partitions;
- Allowance for millwork and specialties;
- Allowance to modify sprinkler heads, relocate the existing and adjust associated piping to suit new ceiling;
- Allowance for HVAC redistribution;
- Allowance for power to each workstation through power poles and perimeter walls;
- Allowance for ambient lighting in main space and pendant lighting throughout;
- Demolition of existing conditions as required:
- Media Zone:
  - 16mm type C gypsum board
- 12mm particle board sealed with acoustic sealant
- 16mm type C gypsum board (taped)
- 75 mineral fiber insulation
- 92 metal framing at min, 400 O.C. 16 gypsum board
- Acoustically treated door
- Acoustic ceiling, assembly below:
  - ceiling mounted vibration hangers
  - heavy-duty T-bar grid 600mm x 450mm
  - 75mm mineral fiber insulation
  - 16mm type C gypsum board
  - 12mm particle board
  - 16mm type C gypsum board
- Acoustic wall panels
- Thermal and acoustic insulation to ductwork / Acoustically lined transfer air ducts

### Estimated Costs

The following is the total estimate for both hard and softs costs (exclusive of HST) for the retrofit of Main Branch - Main Level. For a detailed elemental cost breakdown, please refer to Appendix C.

**Total Hard Costs (including demolition and allowances and contingencies - \$332,000**

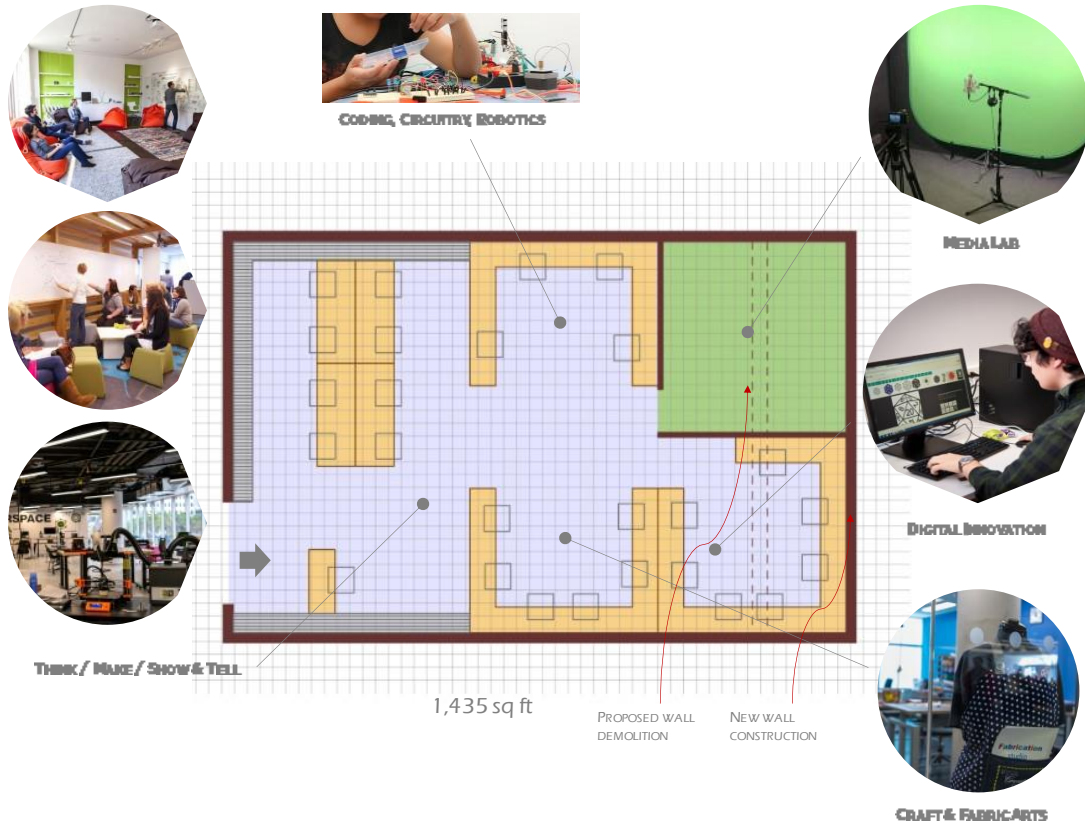
**Total Soft Costs (including contingency) - \$60,000**

**Total Estimated Hard and Soft Construction Costs - \$392,000**



## 6.8 MCLEAN BRANCH – MCLEAN ROOM #1 [W/ EXTENSION]

### Space Layout



**Ajax Library Makerspace**

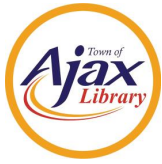
**MCLEAN BRANCH – MCLEAN ROOM #1**

Background Grid for Dimensional Approximations @ 1'x1'

### Base Assumptions

The following are assumptions for construction to inform cost estimates (furniture and equipment is included in separate equipment and furniture list in previous section 6.3):

- Space size - 1,435 sq. Ft.;
- Demolition of existing block partition wall between community room and library and build new block wall as shown;
- 50% of new wall to be glass;
- Create new entrance from makerspace to library at east end;
- Cap waterline where kitchen counter removed;
- Demolish existing book drop and relocate to other part of library (TBD);
- Infill existing door opening where single door removed;



- Concrete block partition to library side, gypsum board partition to makerspace side;
- Furring to concrete block partition;
- Demolition of existing drywall ceiling, retain exposed ceiling;
- Resilient sheet flooring throughout;
- Allowance to repair existing floor where existing partitions removed;
- Paint finish to partitions;
- Allowance for millwork and specialties;
- Allowance to modify sprinkler heads, relocate the existing and adjust associated piping to suit new ceiling;
- Allowance for HVAC redistribution;
- Allowance for power to each workstation through power poles and perimeter walls;
- Allowance for ambient lighting in main space and pendant lighting throughout;
- Demolition of existing conditions as required:
- Media Zone:
  - 16mm type C gypsum board
- 12mm particle board sealed with acoustic sealant
- 16mm type C gypsum board (taped)
- 75 mineral fiber insulation
- 92 metal framing at min, 400 O.C. 16 gypsum board
- Acoustically treated door
- Acoustic ceiling, assembly below:
  - ceiling mounted vibration hangers
  - heavy-duty T-bar grid 600mm x 450mm
  - 75mm mineral fiber insulation
  - 16mm type C gypsum board
  - 12mm particle board
  - 16mm type C gypsum board
- Acoustic wall panels
- Thermal and acoustic insulation to ductwork / Acoustically lined transfer air ducts

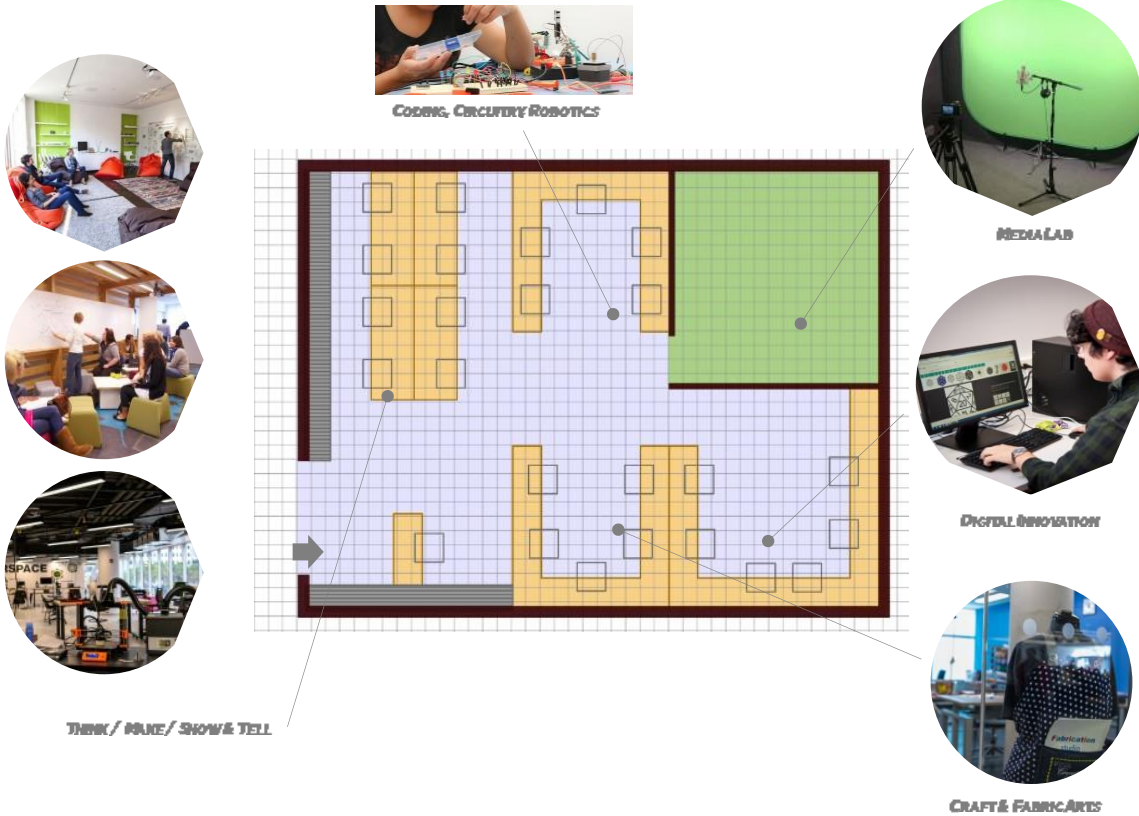
### Estimated Costs

The following is the total estimate for both hard and softs costs (exclusive of HST) for the retrofit of Main Branch – Main Level. For a detailed elemental cost breakdown, please refer to Appendix C.

**Total Hard Costs (including demolition and allowances and contingencies - \$385,000**  
**Total Soft Costs (including contingency) - \$68,000**  
**Total Estimated Hard and Soft Construction Costs - \$453,000**

## 6.9 MCLEAN BRANCH- MCLEAN ROOM #1 [W/O EXTENSION]

Space Layout



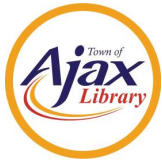
**Ajax Library Makerspace**

**MCLEAN BRANCH – MCLEAN ROOM #1 [W/O EXTENSION]**  
Background Grid for Dimensional Approximations @ 1'x1'

### Base Assumptions

The following are assumptions for construction to inform cost estimates (furniture and equipment is included in separate equipment and furniture list in previous section 6.3):

- Space size - 918 sq. Ft.;
- Cap waterline where kitchen counter removed;
- Infill existing door opening where single door removed;
- Retain concrete block partition to library side, gypsum board partition to makerspace side;
- Furring to concrete block partition;
- Demolition of existing drywall ceiling, retain exposed ceiling;
- Resilient sheet flooring throughout;
- Allowance to repair existing floor;
- Paint finish to partitions;



- Allowance for millwork and specialties;
- Allowance to modify sprinkler heads, relocate the existing and adjust associated piping to suit new ceiling;
- Allowance for HVAC redistribution;
- Allowance for power to each workstation through power poles and perimeter walls;
- Allowance for ambient lighting in main space and pendant lighting throughout;
- Demolition of existing conditions as required:
- Media Zone:
  - 16mm type C gypsum board
- 12mm particle board sealed with acoustic sealant
- 16mm type C gypsum board (taped)
- 75 mineral fiber insulation
- 92 metal framing at min, 400 O.C. 16 gypsum board
- Acoustically treated door
- Acoustic ceiling, assembly below:
  - ceiling mounted vibration hangers
  - heavy-duty T-bar grid 600mm x 450mm
  - 75mm mineral fiber insulation
  - 16mm type C gypsum board
  - 12mm particle board
  - 16mm type C gypsum board
- Acoustic wall panels
- Thermal and acoustic insulation to ductwork / Acoustically lined transfer air ducts

### Estimated Costs

The following is the total estimate for both hard and softs costs (exclusive of HST) for the retrofit of McLean Room #1 [w/o Extension]

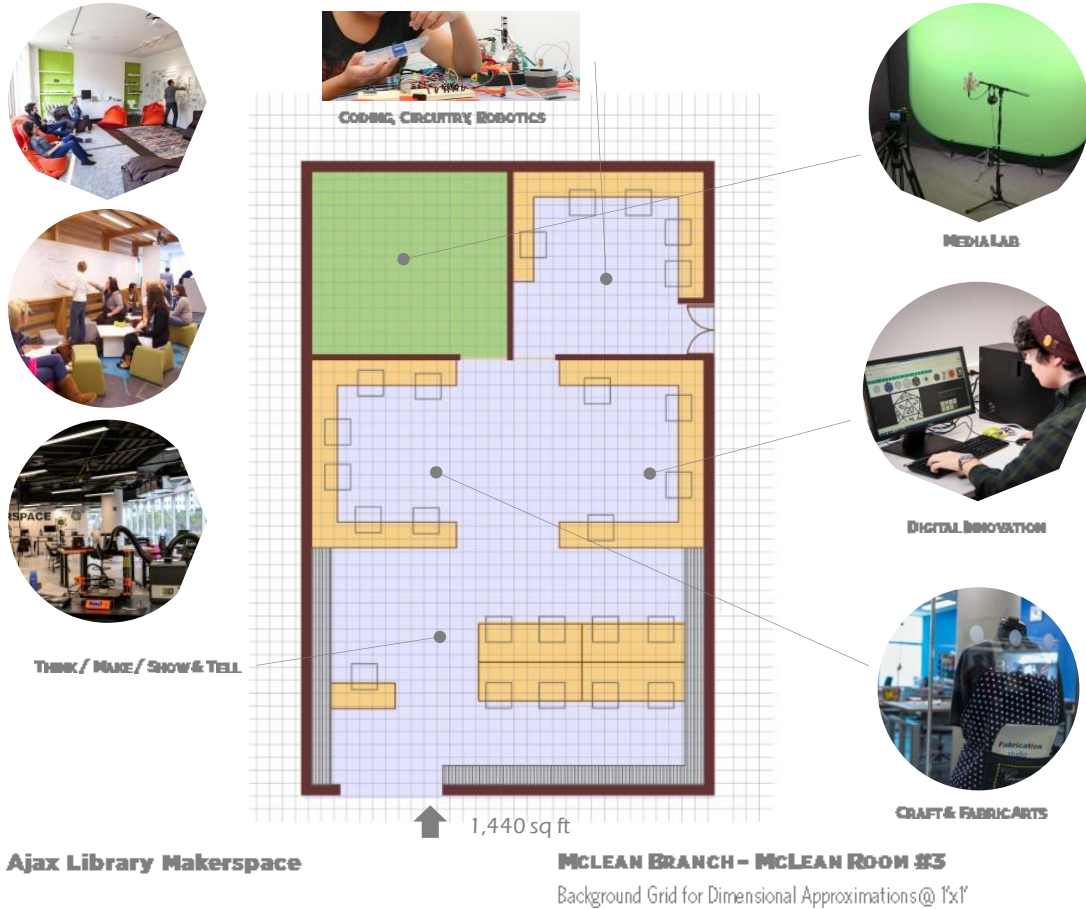
**Total Hard Costs (including demolition and allowances and contingencies - \$254,000**

**Total Soft Costs (including contingency) - \$45,000**

**Total Estimated Hard and Soft Construction Costs - \$299,000**

## 6.10 MCLEAN BRANCH – MCLEAN ROOM #3

### Space Layout

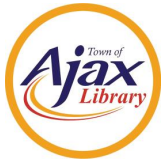


### Base Assumptions

The following are assumptions for construction to inform cost estimates (furniture and equipment is included in separate equipment and furniture list in previous section 6.3):

- Space size - 1,440 sq.ft.;
- Create new entrance from makerspace to library along west wall;
- Cap waterline where kitchen counter removed;
- Demolish existing book drop and relocate to other part of library (TBD);
- Infill existing door opening where single door removed;
- Concrete block partition to library side, gypsum board partition to makerspace side;
- Furring to concrete block partition;
- Demolition of existing drywall ceiling, retain exposed ceiling;





- Resilient sheet flooring throughout;
- Allowance to repair existing floor where existing partitions removed;
- Paint finish to partitions;
- Allowance for millwork and specialties;
- Allowance to modify sprinkler heads, relocate the existing and adjust associated piping to suit new ceiling;
- Allowance for HVAC redistribution;
- Allowance for power to each workstation through power poles and perimeter walls;
- Allowance for ambient lighting in main space and pendant lighting throughout;
- Demolition of existing conditions as required;
- Media Zone:
  - 16mm type C gypsum board
- 12mm particle board sealed with acoustic sealant
- 16mm type C gypsum board (taped)
- 75 mineral fiber insulation
- 92 metal framing at min, 400 O.C. 16 gypsum board
- Acoustically treated door
- Acoustic ceiling, assembly below:
  - ceiling mounted vibration hangers
  - heavy-duty T-bar grid 600mm x 450mm
  - 75mm mineral fiber insulation
  - 16mm type C gypsum board
  - 12mm particle board
  - 16mm type C gypsum board
- Acoustic wall panels
- Thermal and acoustic insulation to ductwork / Acoustically lined transfer air ducts

### Estimated Costs

The following is the total estimate for both hard and softs costs (exclusive of HST) for the retrofit of Main Branch - Main Level. For a detailed elemental cost breakdown, please refer to Appendix C.

**Total Hard Costs (including demolition and allowances and contingencies - \$358,000**

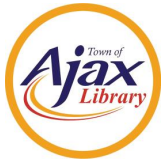
**Total Soft Costs (including contingency) - \$64,000**

**Total Estimated Hard and Soft Construction Costs - \$422,000**

## SECTION 07

# OPERATING FRAMEWORK





## 7. OPERATING FRAMEWORK

### 7.1 INTRODUCTION

The following operational plan details how the makerspace will function, including staffing needs, operating hours, training, partnerships, and support programs.

### 7.2 STAFFING NEEDS

In our discussions with makerspace operators, the need for adequate staffing was repeatedly identified as critical for success of any makerspace. With these conversations in mind, the following staff are recommended.

#### Permanent Staff

1 Dedicated Full-time Makerspace Coordinator: responsible for monitoring the makerspace on a daily basis, assisting users in accessing equipment, and answering basic user questions. Coordinators will also be responsible for managing space bookings and organizing programs with public partners.  
3 Part-time Makerspace Assistants: responsible for monitoring the makerspace, assisting users in accessing equipment, and answering basic user questions.

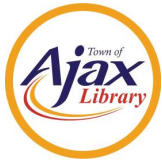
During our consultation, many community leaders, external stakeholders, and members emphasized the importance of the makerspace staff members representing the diversity of the users and the town of Ajax overall. This idea should be taken into account when hiring for permanent positions in the makerspace.

#### Specialized Training

Because much of the equipment, software, and tools in the makerspace require specialized training to properly operate, subject matter experts and technology enthusiasts should be hired wherever possible to establish regular working procedures and provide the technical assistance makerspace users will require. This is especially true of the Media Lab and Coding, Circuitry and Robotics Lab. The library should also establish relationships with local community partners (either individuals or organizations) with applicable skills for programming and outreach

#### Total Staffing Needs

An estimated total of 2.5 FTEs will be required to coordinate and monitor the makerspace, as well as assist users and lead support programs. The estimated hourly pay band for these staff members will be \$24.96-\$29.37 (subject to job evaluation after 12 months).



## Reporting Structure

The makerspace staff will be part of a Makerspace Team within the Corporate Technology Services Team, reporting to the Coordinator of Corporate Technology Services. Existing Corporate Technology Services team members will support the Makerspace Team

## 7.3 OPERATING HOURS

In order to establish consistency, hours should largely mirror those of the library branch where the makerspace is located. However, limited operating hours was one of the most frequently raised concerns of the public during consultation. In response to this, the makerspace should have a minimum of 1-2 days a week of late-night hours to accommodate individuals with limited availability. The makerspace should also remain open on weekends.

## 7.4 EQUIPMENT ACCESS AND TRAINING

All Makerspace users will be required to sign in at the front desk using their Ajax Public Library Account. The same account will be used to access computers and equipment in the labs, book time for independent creation, and check out project kits. First time users will be required to complete a makerspace waiver and agree to overall terms of use.

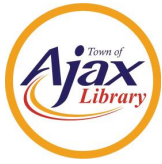
Some equipment will require specialized training to access independently (similar to existing 3D printer certification course). Training modules should be made available online to increase accessibility.

Suggested required training modules

- 3D printing Training
- Glowforge Training
- Media Lab Training (Video)
- Media Lab Training (Audio)
- Media Lab Training (Photography)

Suggested optional training modules

- Sewing Machine Training
- Embroidery Machine Training
- Vinyl Cutting Training
- Introduction to Arduinos
- Introduction to Raspberry Pi
- Introduction to Lego Mindstorm
- Introduction to Video Game Design with Construct 3
- Heat Transfer Training



Makerspace users will be able to book equipment and space to guarantee availability. Some bookings will be mandatory, while others will be optional.

- **Media Lab (Mandatory Booking):** Two- and four-hour sessions available. Maximum one booking per user per day (unless authorized by Makerspace manager)
- **Digital Innovation Workstation (Optional Booking):** One- and two-hour sessions available. Only one workstation will be eligible for booking, with the rest first-come first-serve.
- **3D Printer (Optional Booking):** Users should arrive for their booking with their file ready to print. Print jobs run for a maximum of 5 hours Monday-Wednesday and 3 hours Thursday-Sunday.
- **Think Zone (Optional Booking):** One- and two-hour sessions available. Maximum two bookings per user per day. Bookings must be approved by Makerspace Staff.

## 7.5 PARTNERSHIPS

Ajax Public Library’s Makerspace should seek partnerships with a variety of organizations to meet operational needs. The following partnership recommendations were generated through stakeholder interviews and independent research.

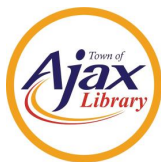
### 7.5.1 Funding and Operations Partners

Funding and operational partners could provide support by funding the makerspace overall, sponsoring specific areas or programs related to their line of business, or give input on the types of skill development they are seeking in the Ajax community.

Ajax Pickering Board of Trade
Ajax Textile Corporation
Amazon
Best Buy
Canadian Robotics
Crestpoint Developer
Elexicon Energy
Existing Funding and Operations Partners
Home Depot
Long & McQuade
Ontario Power Generation
Safran Landing Systems

### 7.5.2 Community and Educational Partners

Community and educational partners will be critical to spreading the word about the makerspace and engaging with a wide variety of users. The organizations listed here could be partners for targeted programming, could use the space for their own programming needs, or could introduce their members to the makerspace through tours and info sessions to raise awareness.



Afghan Women’s Settlement Organization	Durham Continuing Education
Ajax Camera Club	Durham District School Board
Ajax Creative Arts	Durham Parent Advisory Council
Ajax Ontario Early Years Centre	Durham Tamil Association
Arts on Fire	Durham Youth Services
Black Physicians of Tomorrow	Enaahutig Healing Lodge & Learning Centre
Boys & Girls Club of Durham	First Peoples Indigenous Centre at Durham College
Business Advisory Center Durham	Friends Indeed Canada
Canadian Council of Muslim Women	Girls Incorporated of Durham
Canadian Mental Health Association	Hispanic Canadian Alliance of Durham
Carea	Islamic Foundation School Durham
Chinese Community Association	MNO Oshawa and Durham Region Métis Council
Community Living	Muslim Educators Network Group (Durham School Board)
Congress of Black Women	Ontario Shores
Cultural Expressions Art Gallery	Ontario Technical University
DCDSB	PFLAG Durham Region
Durham Bangladeshi Canadian Community	Pickering Christian School
Durham Black Educators Network	Scientists in School
Durham Canadian Chinese Cultural Centre	Side by Side Family Centre
Durham College	STEM Minds

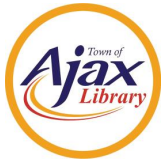
## 7.6 SUPPORT PROGRAMS

Throughout our public consultation, internal and external interviews, and interviews with other makerspace operators, the importance of a robust slate of support programs was repeatedly emphasized. Creating a wide range of formal classes, meetup groups, and facilitated sessions will enhance the tools and software with which the makerspace will be equipped.

In the public survey, a majority of respondents (76%) identified that their preferred makerspace experience would be “with a group and a teacher”. The second most frequently selected answer was “on my own” (43%). Support programs can fulfill the desire for taught experiences, while also giving users the skills needed to access the space independently.

Program hours will be based on instructor availability and convenience to target audience. While some support programs will be developed and executed entirely by makerspace staff, others should be developed in collaboration with community and educational partnerships. Examples of the types of programs developed in conjunction with partners could include meetings for Girls in STEM clubs organized through the school board, tours and tutorials for students organized through the school board, classes presented with Ontario Technical University, and tutorials or classes in multiple languages presented with various community partners.





Other outreach programs can be undertaken to encourage new users and build a vibrant community around the makerspace. Off-site outreach programs where makerspace staff bring easily transportable activities (i.e. Sphero Bot, button maker, VR headset) and examples of finished projects to various community partner events, schools, and other offsite events could be created. Community engagement initiatives such as a display housed in the same building as the Makerspace that allows users to show off their creations, could work to build a community of existing users and generating interest from potential users. An annual meetup of Makerspace users would allow them to share projects they completed using the makerspace.

### 7.6.1 Types of Support Programs

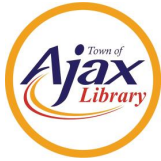
In order to meet the needs of makerspace users, and provide options for a variety of different interests, creating multiple types of support programs are recommended. The following example program categories were created based on what was reported through public consultation, as well as feedback from other makerspace operators.

- **Clubs:** Recurring sessions created in conjunction with programmatic partners where interested individuals can gather, share skills, and discuss their interests. Duration 1-3 hrs.
- **Labs:** Defined times where labs are open for use with subject matter experts on hand to answer questions and guide makerspace users in their projects. Duration 2-4 hrs.
- **Tutorials:** Short how-to classes led by library employees, contractors, or volunteers that demonstrate how to use a specific piece of equipment or perform a specific task. These are one-time events and don't require recurring attendance. (Duration 1 hr)
- **Classes:** Ongoing classes led by library employees or contractors that teach makerspace users a specific set of related skills over time. Classes are recurring weekly or bi-weekly, lasting 8-10 sessions. Duration 1-2 hrs.

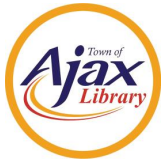
### 7.6.2 Example Support Program Calendar

An example support calendar was developed in order to provide a visualization of what types of programs could be created. Although the exact programs will likely change during makerspace development, the following principles were used to create the example calendar:

- Ample programming should be provided to give novice users training for the equipment, which they may be unfamiliar with or unable to access on their own
- Programs should facilitate learning, and mainly be guided by an instructor in a group setting.
- Programs were scheduled to provide a mix of facilitated and independent use in each zone throughout the week
- Example programs are facilitated both by the library and in conjunction with partners, responding to community desire to engage with organizations that they are already familiar with in the makerspace setting
- A wide range of programs were envisioned to reflect the needs of users and to transform the makerspace a community gathering space, a space for formal instruction, and a space for exploration and casual learning.



		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
<b>Week 1</b>	Craft & Fabric Arts			Crafting Club (with Community Partner)	Sewing Classes			Embroidery Machine Tutorial
	Digital Innovation				3D Video Tutorial	Music Editing Tutorial	Video Game Creation Class	Video Editing Lab
	Coding, Circuitry, and Robotics		Robotics Club (with Community Partner)		Programming & Robotics Lab	Programming Class (with Community Partner)	Programming & Robotics Lab	Programming Club (with Community Partner)
	Media Lab			Video Recording Lab		Video Recording Lab	Music Recording Lab	
	Make Zone		3D Printing Tutorial			Cricut Tutorial	Glowforge Tutorial	
<b>Week 2</b>	Craft & Fabric Arts				Craft & Fabric Arts Lab		Heat Press Tutorial	
	Digital Innovation			Digital Illustration Class		Music Editing Tutorial		Video Editing Lab
	Coding, Circuitry, and Robotics		Robotics Club (with Community Partner)		Programming & Robotics Lab		Programming & Robotics Lab	Introductory Programming Class
	Media Lab			Music Recording & Production Class		Video Recording Lab	Music Recording Lab	
	Make Zone		3D Printing Tutorial				3D Printing Tutorial	Vinyl Cutting Tutorial



In order to facilitate user exploration and minimize staffing requirements, the makerspace should implement two resource development initiatives at the outset of the project. These resources will allow those who want to work independently to use the equipment outside of structured classes. Introductory Project Kits will contain supplies and instructions for completing basic projects in the makerspace, introducing new users to the equipment and giving examples of what is possible in the makerspace for those who want to explore independently. Suggested project kits include:

- **Heat Transfer T-shirts:** includes instructions, heat transfer paper, heat transfer vinyl. Users provide their own shirt
- **Button Making:** includes instructions, 5 pinned back button shells
- **Controlling LEDs with Raspberry Pi:** contains LED lights, Raspberry Pi, and instructions
- **Embroidered Patch:** contains instructions, USB with basic design files. Users provide their own backing fabric
- **3D Printing:** contains instructions and USB with basic design files
- **Coding Kit:** contains iPad loaded with coding links and instructions

### 7.6.3 User Manuals

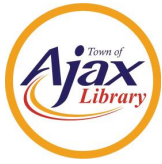
User Manuals will instruct makerspace users on how to operate machinery and perform basic functions. They will be available through multiple platforms: physical binders in the space, slides available online, and instructional videos available online. Suggested manuals include:

- Janome Memory Craft Embroidery Machine
- Heat Transfer Press
- Making 360 degree videos
- Using the Media Lab to record video
- Using the Media Lab to take photos
- Using the Media Lab to record music
- Using the Media Lab to record a podcast
- 3D Printing
- 3D Laser cutting and engraving with Glowforge
- Vinyl cutting with Cricut
- Vinyl cutting with Roland
- Introductory programming with Sphero
- Introductory video game design with Minecraft
- Intermediate video game design with Construct 3

## SECTION 08

# CONCLUSIONS AND RECOMMENDATIONS





## 8. CONCLUSIONS AND RECOMMENDATIONS

Through a thorough process of consultation with stakeholders, community partners, Library staff and Senior Management, Town of Ajax staff, Town Councillors, and the broader community it was determined that a makerspace was not only a welcome addition to the town but enthusiastically supported. Together with a market analysis and an examination of both comparable and aspirational makerspaces in Canada and the US, and through collaboration with and input from the Ajax Public Library senior management team, the following concept for a makerspace in Ajax has been defined and developed:

The Ajax Makerspace will be a community-based program, collaborative, and creative workplace. It will be an inclusive and accessible space where residents of all ages, backgrounds and abilities will be able to experiment, explore, ideate and create.

The Makerspace will be physically located in one of the three Ajax Public Library (APL) branches and will be operated, managed and staffed by the APL. It will provide free-of-charge access to hands-on tools, instruments, machines and equipment – both low tech and high tech – in a safe and welcoming environment. Additionally, the Makerspace will offer structured and informal learning opportunities including specific classes, workshops and tutorials.

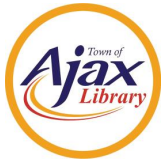
The primary goals of the Makerspace are to foster creativity and innovation, support skill development and provide opportunities for life-long learning. The Ajax Makerspace is conceived as one space located in one Ajax Public Library location. If both demand and need warrant it, the Library could look to either increase in size or expand to include to other locations in Ajax.

The makerspace will be programmatically and physically organized as three distinct areas:

1. Make Zone
2. Think Zone
3. Create Zones – within these zones are:
  - Craft and Fabric Arts
  - Digital Innovation
  - Coding, Circuitry and Robotics
  - Media Lab

The zones and experiences are described more fully in the previous chapter. Within each of the zones will be a wide array of equipment and tools – both high tech and low tech – for Ajax residents to try out, to experiment with and above all to create.





## 8.1 RECOMMENDATIONS

The three core recommendations are related to location, staffing and timing.

## 8.2 LOCATION

Through consultation, it was established that the makerspace should be located in an Ajax Public Library branch. Through further examination it was determined the most appropriate and suitable location and space for the makerspace were as follows:

1. Main Branch – Main Level
2. McLean Branch – Community Room #1 with extension
3. McLean Branch – Community Room #1 without extension
4. McLean Branch – Community Room #3

Of the four scenarios above it is our recommendation that the Library move forward with McLean Branch – Community Room #1 without extension for the following reasons:

McLean is within a community and recreation centre, whereby the library can take advantage of visitors using the other facilities within the complex.

Community Room #1 is already physically integrated within the branch.

It has direct and independent access to the front entrance of the community centre, so could operate even if the library is closed.

It has street visibility, so the space could be branded and signed independently.

Community Room #1 was costed with and without extension. The cost without extension is considerably less expensive than with extension with minimal disruption and limited intervention to the library space. Even though the space without extension is smaller than with extension, we recommend moving forward with the smaller space given the cost and impact on the library space.

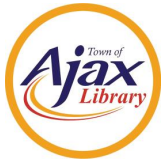
If demand warrants it, the Library can extend McLean Room #1 at a later date or consider a second location.

The estimated order of magnitude hard and soft construction costs to retrofit McLean Room #1 with extension is \$299,000.

## 8.3 STAFFING

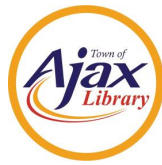
It is our recommendation that the makerspace be staffed. One of the biggest lessons learned from other makerspace is that staffing is critical to not only manage the space but to engage with users, teach visitors how to use the equipment and to deliver programs and services. 1 FT and 3 PT staff members are recommended. A more fulsome description of the operations including staffing outlined in the previous chapter.





## 8.4 TIMING

The development of the makerspace should begin once Council approves the full budget including construction and equipment costs. Based on a potential February 2022 approval the timelines for the construction and delivery of the makerspace is as follows:



### 8.5 2022 DEVELOPMENT TIMELINE

Year		2022											
Month		February	March	April	May	June	July	August	September	October	November	December	
1.	Budget Approval	[Timeline bar from Feb to Feb]											
2.	Design Procurement and Contracting	[Timeline bar from Feb to May]											
3.	Design and Approvals	[Timeline bar from May to Oct]											
4.	Permit Procurement	[Timeline bar from Oct to Nov]											
5.	Construction Tendering, Award and Contract	[Timeline bar from Oct to Dec]											
6.	Construction & Commissioning	[Timeline bar from Oct to Dec]											
7.	Equipment and Furniture Sourcing and Tendering	[Timeline bar from Oct to Dec]											
8.	Equipment and Furniture Ordering	[Timeline bar from Oct to Dec]											
9.	Equipment and Furniture Delivery, Installation & Testing	[Timeline bar from Oct to Dec]											
10.	Makerspace Opening	[Timeline bar from Oct to Dec]											

### 8.6 2023 DEVELOPMENT TIMELINE

Year		2023								
Month		January	February	March	April	May	June	July	August	September
1.	Budget Approval	[Timeline bar from Jan to Jan]								
2.	Design Procurement and Contracting	[Timeline bar from Jan to Jan]								
3.	Design and Approvals	[Timeline bar from Jan to Jan]								
4.	Permit Procurement	[Timeline bar from Jan to Jan]								
5.	Construction Tendering, Award and Contract	[Timeline bar from Jan to Jan]								
6.	Construction & Commissioning	[Timeline bar from Jan to Aug]								
7.	Equipment and Furniture Sourcing and Tendering	[Timeline bar from Jan to Apr]								
8.	Equipment and Furniture Ordering	[Timeline bar from Apr to Jul]								
9.	Equipment and Furniture Delivery, Installation & Testing	[Timeline bar from Jul to Aug]								
10.	Makerspace Opening	[Timeline bar from Aug to Sep]								

# APPENDIX A: CASE STUDIES

## LOCAL LIBRARY MAKERSPACES

### Oshawa Public Library MakerSpace at McLaughlin Branch



Image: Oshawa Public Library (<https://oshawalibrary.on.ca/makerspace>)

**Description:** The Oshawa Public Library's MakerSpace aims to be a place where customers can collaborate, share skills, and find resources to engage in high-tech and low-tech activities.

**Resources:** The MakerSpace offers a variety of "high tech" (3D printer, iMac, Green Screen, Projectors) and "old school" (button maker, LEGO, craft supplies) tools that can be used in the space.

**Programs:** The library offers classes and workshops to help children and teens build STEAM skills, which can be further developed in the MakerSpace

**Pricing Structure:** Tools and resources are free to use, but a fee is applied for 3D printing based on printing time.

#### Community Info:

- Population of 159,458
- 14% of the population identifies as a visible minority.
- The median age of residents is 41.2
- Median income is \$70,211 (CAD).

## Burlington Public Library Makerspace



Est.  
March  
2016

2 Spaces  
2,050  
Annual  
Users

Image: Burlington Public Library (<https://attend.bpl.on.ca/event/2025575>)

**Description:** The Burlington Public Library system has a variety of maker programs in its neighborhood branches, with a large makerspace at its Central location. The makerspaces serve as a place for the community to create, invent, and learn together. Makerspaces are only available for use during select public programs. Some equipment (laser cutter) requires an introductory class to be able to use it.

**Resources:** Laser cutter, vinyl cutter, vinyl printer, 3D printer, embroidery machine, sewing machines, a Virtual Reality system Electronic equipment (snap circuits, cubelets, Arduinos, etc.) and digital media resources (green screens, drawing tablets, studio lighting, microphones) are also available.

**Programs:** Regularly scheduled “Open Studio” sessions allow users to access the equipment on a drop-in basis. Introductory classes instruct new users on how to use the equipment. Public programs, events and meetups centred around bookbinding and coding take place in the maker spaces.

**Pricing Structure:** Burlington Public Library charges both for materials and the use of some of its machines including the laser cutter, vinyl machines, embroidery machine

**Of Note:** The Fibre Arts Guild also provides a makerspace in this community within the Art Gallery of Burlington focused on weaving and other fibre arts.

### Community Info:

- Population of 183,314
- 15% of the population identifies as a visible minority.
- The median age of residents is 43.6
- Median income is \$93,588

## Pickering Public Library Maker Space



Est.  
April  
2018

1 Space  
3,200  
Annual  
Users

Image from: Toronto.com (<https://www.toronto.com/community-story/8870903-pickering-s-maker-space-invites-public-to-try-it-out/>)

**Description:** Pickering Library's Maker Space offers communal access to 21<sup>st</sup> century tools and learning styles, giving patrons the ability to explore their creativity and learn new skills on equipment that is not financially accessible to all.

**Resources:** Tools range from low-tech (button maker, heavy-duty sewing machine) to high tech (3D printer, vinyl cutter, drawing tablet). Some are loanable (cameras, a green screen), while others are only available to be used in the library. Those using the maker space are asked to reserve tools ahead of time (which can be done online). Some tools (such as the 3d printer) require certification and staff approval to use. There is also a repository of tech-related toys and tools geared towards younger audiences.

**Programs:** Programs are geared towards a variety of different audiences. Examples include: Photoshop Tutorials (for youth and adults), Word editor basics (for seniors), and Intro to Twitch (for teens and young adults)

**Pricing structure:** Users are asked to pay a fee for materials (i.e. \$0.10 per gram for 3D printing), or pay an hourly fee if they provide their own materials.

### Community Info:

- Population of 91,771.
- 38% of the population identifies as a visible minority.
- The median age of residents is 41.6
- Median income is \$99,701(CAD).



## Markham Public Library MakerSpaces



Est.  
2018

3 Spaces  
16,500  
Annual  
Users

Image: City of Markham <https://www.markham.ca/wps/portal/home/recreation/community-fitness-centres/aaniin/aaniin-community-centre>

**Description:** Markham Public Library has two locations with maker spaces, where users can participate in a collaborative d.i.y. environment, learn digital skills, and access equipment. The spaces introduce STEAM and maker concepts to people of all ages, while providing a resource for established makers. There is also a Kids Makerspace which features toys and tools that build STEAM skills. To use the tools in the space, library members must be trained or approved by a Digital Literacy Specialist and must book independent use time online.

**Resources:** Online booking is required to use tools including: 3D printers, laser cutters, digital embroidery machines, digital die-cut machines, 3D scanners, and iMac computers. Some digital media items (cameras, microphones, and go-pros) are available for check-out with a library card. Users can book one-on-one instruction time with the library's Digital Literacy Specialist.

**Programs:** No public programs specific to the Makerspaces are currently offered (outside of the required training sessions)

**Pricing Structure:** There is a small material charge for some of the equipment.

### Community Info:

- Population of 328,966
- 75% of the population identifies as a visible minority.
- The median age of residents is 41.1
- Median income is \$89,028(CAD).



## Hamilton Public Library Makerspace



Est. ?

17 Spaces  
16,250  
Annual  
Users

Image: Hamilton Public Library (<https://www.hpl.ca/makerspaces/in-action>)

**Description:** The Hamilton Public Library has a number of makerspaces in different library branches, with the largest space at their central location. In response to COVID-19 health restrictions, HPL makerspaces are offering pick-up service for makerspace tools (like 3D printing, vinyl cutting, and large format printing).

**Resources:** 3D printers, large format printers, music recoding equipment and instruments, vinyl cutter, digital embroidery machine, digital conversion machines, and video cameras. Library staff are available for limited assistance, but no expert guidance is given. One-on-one consultation is available if booked in advance.

**Programs:** A variety of public programs focused on education and skill building take place in the makerspaces. A number of tutorials on how to use the equipment and software have been made available online during the COVID-19 pandemic.

**Pricing Structure:** The space is free to use, but some tools require a small materials fee (3D printer, vinyl cutter, large format printer, embroidery)

### Community Info:

- Population of 536,917
- 17% of the population identifies as a visible minority.
- The median age of residents is 41.5
- Median income is \$69,024 (CAD)

## Kingston Frontenac Public Library Create Space



Image: Kingston Frontenac Public Library (<https://www.kfpl.ca/news-and-reviews/library-services/2020/01/02/new-community-space-opening-january-13>)

**Community Info:** Kingston, ON has a population of 123,798. 9% of the population identifies as a visible minority. The median age is 41.8 and the median income is \$67,485 (CAD).

**Description:** The Friends of the Library Create Space is a makerspace giving patrons access to technological resources and tools to foster making and creativity. The space is open to library members over 8 (with adult supervision required for those under 16), and the space is unsupervised by library staff (technical support is not provided). Some public programs incorporate the tools and technology found in the Create Space.

**Resources:** Technological resources include a small-scale 3D printer, a Circuit Maker, a Glowforge Pro laser printer, photo and video editing software, and digitization tools. Other resources include a button and magnet maker, a pick punch, sewing machines, and a tool bench.

**Programs:** Because of COVID-19 restrictions, the Create Space is not currently holding any public programs or events.

**Pricing Structure:** The space and majority of resources are free to use. There is a sliding scale materials fee required to use the 3D printer, ranging from \$0-\$20.

### Community Info:

- Population of 123,798
- 9% of the population identifies as a visible minority.
- The median age of residents is 41.8
- Median income is \$67,485(CAD).

## CANADIAN LIBRARY MAKERSPACES

### Edmonton Public Library Makerspaces



Est.  
2013+

6 Spaces

Image: Edmonton Public Library (<https://www.epl.ca/makerspace/#faqs>)

**Description:** Edmonton Public Library’s Makerspaces offer library card holders access to tools and resources for making and creating. The makerspaces are spread out across 6 different public library branches, with the widest array of resources available at the Stanley A. Milner Downtown location.

**Resources:** Currently, users have access to computer software, 3D printers, digital conversion tools, a heat press, recording equipment and vinyl cutting (depending on which location they visit). The Makerspace also includes the “Fab Lab”, a workshop including tools such as a CNC machine, laser engraver, drill press, and scroll saw that users can access after completing a safety certification course. There is also a Children’s Makerspace, which features tools and activities geared towards children between the ages of 3-12. The Makerspaces are monitored by library personnel who are available to assist customers when using the tools.

**Programs:** Instructional classes are offered based on using the equipment and are required for users to be certified for independent use of the facilities.

**Pricing Structure:** The majority of resources are free to access, although a small materials fee is charged for some services. (i.e. 3D printing is \$0.10/ gram)

#### Community Info:

- Population of 932,546.
- 35% of the population identifies as a visible minority.
- The median age of residents is 35.7.
- Median income is \$87,255(CAD).

## Lou Duggan Creative Studio at Halifax Public Library



Est.  
January  
2020

Left: Image: Halifax Public Library (<https://www.halifaxpubliclibraries.ca/blogs/post/lou-duggan-creative-studio-grand-opening/>); Right: Image: Halifax Public Library (<https://www.halifaxpubliclibraries.ca/blogs/post/lou-duggan-creative-studio-grand-opening/>)

**Location:** Halifax Central Library

**Founded:** January 2020

**Community Info:** Halifax, NS has a population of 403,131, 11% of whom identify as visible minorities. The median age is 41.0 and the median household income is \$69,553.

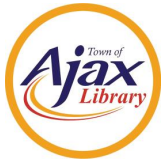
**Description:** The Lou Duggan Creative Studio is a state of the art facility containing a wide variety of tools, resources, and equipment. The studio contains supplies for crafting, gardening, knitting, sewing, cooking, and technology. The library also has a media room, which contains music recording equipment and a music studio. The media room is available to be booked anytime, but other equipment is only available during pre-scheduled "Studio DIY" sessions. The Creative Studio launched in January 2020, but was not able to fully open to the public before COVID-19 related closures, so the impact of the space and associated programs is currently still unknown.

**Resources:** The Lou Duggan Creative Studio has a full kitchen, a variety of crafting equipment, 3D printers, and electronic tools. The Media Studio contains instruments, audio recording equipment, and video recording equipment that can be used in 2 recording studios. Other resources include sewing machines, Cricut cutters, and 3D printers. Staff is on hand to help users with the equipment during their session.

**Programs:** The Halifax Public Library offers educational programs allowing people to learn basic and advanced technological skills. Online learning is available through LinkedIn learning.

**Pricing Structure:** Use of the resources is free to library members.





## INTERNATIONAL LIBRARY MAKERSPACES

### Chattanooga Public Library



Est.  
January  
2012

Image: Chattanooga Public Library  
(<https://www.flickr.com/photos/chattlibrary/14265856030/in/album-72157631269756074/>)

**Description:** Chattanooga Public Library’s 4<sup>th</sup> Floor makerspace and The Studio serve as a community resource and educational center focused on media, technology, design, and art. The spaces host equipment, events, and meetings, offering community access to both tools and instruction. The 4<sup>th</sup> floor was the first library space in the U.S to offer public access to 1-gig speed internet. A similar Makerspace located on the library’s second floor is geared towards kids and teens. The 2<sup>nd</sup> floor space has more support, and serves not only as a resource for making but also a educational opportunity.

**Resources:** The 4<sup>th</sup> floor contains technological resources like 3d printers, laser cutters, vinyl plotters, CNC routers, a virtual reality booth, and a photo studio. Other tools include a loom, a zine making lab, a sewing lab, power and hand tools, and soldering tools. There are also event and co-working spaces open to the community. The Studio contains a full state-of-the art recording facility, including three live rooms, software, microphones, and headphones. The Studio has a dedicated staff member, available for one-on-one tutorials. The 2<sup>nd</sup> floor youth makerspace includes 3D printers, computers, and analog making tools.

**Programs:** Classes and events for all ages are programmed in the 4<sup>th</sup> floor space. Since the COVID-19 pandemic, the Chattanooga Public Library has incorporated STEAM learning activities into their “Make, Play, Read, Learn” at-home library program.

**Pricing Structure:** Most of the tools and resources available are free to use, but some (3D printers, Vinyl Plotter) require a materials fee. Use of The Studio is free, but those interested must fill out an application detailing their skill level and purpose.

**Community Info:**

- Population of 179,139.
- 44% of the population identifies as a visible minority.
- The median age of residents is 38.2
- Median income is \$41,859(USD).

## The Bubbler at Madison Public Library



Right: Image: The Bubbler (<http://madisonbubbler.org/learninginlibraries>)

**Community Info:** Madison has a population of 258,034. The median age of the population is 30.5 and the median household income is \$64,101 (USD). 28% of the population identifies as a visible minority.

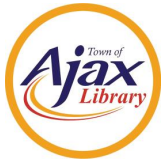
**Description:** Madison Public Library has a multi-location arts and technology hub called The Bubbler, focused on connecting communities through hands-on making experiences. Although the makerspace does include a media lab with a variety of technological resources, the program as a whole is more focused on artistic activities than providing STEM resources. It supports multiple artist-in-residence programs. Besides the physical resources available in the library, The Bubbler has partnered with community organizations such as Maker Ed, Google’s Making Spaces program, and the Dane County Juvenile Correction system.

**Resources:** A media lab which includes access to hardware (iPads, computers, green screens, sound booths, and cameras) and software to facilitate digital media creation. Staff with particular areas of expertise are available to provide assistance to users. The Bubbler also provides “maker kits” for in-house programs and to educators. The kits contain activities meant to develop artistic, technological, or fine motor skills among children. Instructions for many of the kits are available online.

**Programs:** The Bubbler hosts a variety of public programs geared towards kids, teens, and adults. Many take place outside of the physical space of the library and involve a wide range of partners. Some are more educational or instructional, while others are focused on connecting the community with art.

**Pricing Structure:** all resources are free to use. Some maker kits require the purchase of consumable materials.





## DENVER PUBLIC LIBRARY IDEALAB



Est.  
2013

Image: Denver Public Library  
(<https://www.denverlibrary.org/blog/technology-library-events/nate/come-meet-maker-residence>)

**Location:** Currently, there are 5 ideaLABs throughout the Denver Public Library System, specifically focused in traditionally under-resourced neighborhoods.

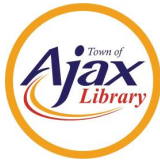
**Community Info:** Denver has a population of 716,492. The median household income is \$68,377 (USD) and the median age of residents is 34.6. 46% of the population identifies as a visible minority.

**Description:** Denver Public Libraries has multiple locations of ideaLABs, makerspaces that provide tools and resources to make media projects and learn about electronics. Some locations are more focused on physical making and have more hand tools, drills, and saws, while others are focused on learning at all ages, providing a selection of electronic tools and toys. The library's central location has the largest ideaLAB with the widest range of resources. The ideaLAB was designed to be accessible to a wide range of community members and to encourage participation from traditionally underserved users. Programs are offered in multiple languages. In response to COVID-19 restrictions, some ideaLAB resources have been made available through Denver Public Library's Bookmobile service.

**Resources:** Technological resources include: 3D printers, Cricut cutting machines, Wacom tablets, laser cutter, and assorted computers with software tools. Locations also feature electronic tools and toys (Arduinos, MakeyMakeys, LittleBits). "Hands-on" tools include digital embroidery machines, soldering tools, button maker, sewing machines, looms, assorted saws, drills, and hand tools. Music studios and recording studios are available at certain locations. Each location has a "Maker-In-Residence" who leads public programs and workshops in the space.

**Programs:** Free, all ages maker workshops are available. Programming is often offered in both English and Spanish. Family events are organized in partnership with Colorado University Boulder's Family Creative Learning Team.

**Pricing Structure:** The ideaLAB is free to everyone, with no library card required. There are no material fees charged for any service.



## The Dorothy Lumley Melrose Center at The Orlando Public Library

Est.  
February  
2014



Left: The Melrose Center (<http://tic.ocls.info/update-from-behind-the-walls/>)

Right: The Melrose Center

(<https://www.facebook.com/MelroseOrlando/photos/a.1418969978364216/1935489700045572/?type=3&theater>)

**Community Info:** The population of Orlando is 285,705. Median household income is \$51,820 and median age is 33.9. 64.2% of the population identified as a visible minority

**Description:** The Melrose Center at The Orlando Public Library is a multi-faceted resource for technology, innovation, and creativity. The 26,000 square foot space contains video and audio production studios, a digital photography studio, a fabrication lab, a simulation lab, an interactive media wall, conference rooms, and presentation spaces. Some resources (such as the audio and video production studios, editing bays, simulation labs, and conference rooms) are able to be used independently, while the fabrication lab can only be used during scheduled classes. During the COVID-19 pandemic, Melrose Center resources have been used to 3D print protective equipment for frontline workers at a local hospital

**Resources:** The Melrose Center contains resources specific to each of its labs including sound and video recording equipment, digital photography equipment, interactive simulators, and technological fabrication equipment (i.e. 3D printers, CNC routers).

**Programs:** The Melrose Center hosts a variety of classes and events geared towards creating an interactive community of makers. a wide range of classes teach makers new skills. Those who are interested in accessing the resources are required to take both general and specialized classes training them on how to use the equipment. Events include media-specific meetup groups, while classes may cover specific technical skills (like video editing using open-source software) or creating a specific craft (like a pop-up valentines day card). In reaction to the COVID-19 Pandemic, events have shifted online.

**Pricing Structure:** Resources are free to library card holders, and available for a fee to out-of-district residents who sign up for a special access cards.

## NON-LIBRARY MAKERSPACES

*Museums, Science Centres, Community Centres*

### Makerspace at The New York Hall of Science



Image: Situ Studio (<http://www.situstudio.com/works/built/maker-space#>)

**Community Info:** Corona, Queens has a population of 109, 695. 95% of the population identifies as a visible minority. The median household income is \$51,992 (USD).

**Description:** The Makerspace at The New York Hall of Science serves to further the museum's mission of bringing interactive science to New York's schools, families, and underserved communities. The Makerspace is mainly geared towards children, facilitating learning through hands-on making and guided workshops.

**Resources:** The Makerspace contains a variety of tools and technological resources for visitors to use, through staff guided programs and workshops.

**Programs:** A variety of workshops for individuals and student groups are offered. Also offered are a variety of professional development programs that teach educators how to incorporate maker activities into the classroom. NYSCI offers custom consultation and coaching for schools or groups looking to build their own makerspace.

**Pricing Structure:** The makerspace is accessed through the museum, so museum admission is required. Fees are also required for group workshops

## Moffitt Makerspace at UC Berkeley



Est. 2017

Image: UC Berkeley Library (<https://stories.lib.berkeley.edu/student-fellows/creating-community/>)

**Community Info:** Moffitt Makerspace primarily serves the students, faculty, and staff of UC Berkeley

**Description:** Moffitt Makerspace is a general access makerspace in the Moffitt Library at the University of California's Berkeley Campus. It is operated by the library staff, in partnership with b.makerspace, a collective of student clubs interested in making. The makerspace is also available for teachers who would like to integrate it into their curriculum.

**Resources:** Tools include 3D printers, CAD software, hand tools and a button maker. Electronic components (Arduino, Raspberry Pi) are also available. Staff are available to offer support and training every weekday, and by appointment.

**Programs:** Training workshops are available to guide users in both basic use of machines and more advanced projects.

**Pricing Structure:** All services are provided free of charge, and there are no materials fees.



## Draper Spark!Lab at Smithsonian



Est. 2008  
Reno  
2020

Image: Spark!Lab (<https://americanhistory.si.edu/exhibitions/sparklab>)

**Community Info:** Although Spark!Lab is located in Washington D.C., it is housed inside the National Museum of American History, meaning it serves a different population than just local residents and communities.

**Description:** Part of the Lemelson Center for the Study of Innovation and Invention, Spark!Lab is a place for children between the ages of 6-12 to experiment and learn STEM skills. The lab is designed to emphasize the process of invention. Guided activities connect to broad themes on display in the museum, and visitors are given worksheets to complete that reinforce core educational concepts. Spark!Lab is part of the Smithsonian National Museum of American History. There are other Spark!Lab locations around the country .

**Resources:** Spark!Lab contains tools and resources for visitors to perform guided activities. The space is fully staffed, and Spark!Lab also offers online resources for parents and teachers who want to integrate hands-on making into learning experiences.

**Programs:** While there are no formal or timed programs, all Spark!Lab activities are guided by staff members. Spark!Lab does play host to national “invention” contests that children from around the country are invited to submit to (physical attendance is not required).

**Pricing Structure:** Spark!Lab is accessed through the National Museum of American History, and the cost of using the space is included in museum admission (free).



## Victoria Makerspace



Est. 2010

Image: Victoria Makerspace  
(<https://www.facebook.com/VicMakerspace/photos/pb.508647729178147.-2207520000../889320784444171/?type=3&theater>)

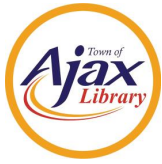
**Community Info:** Victoria has a population of 85,792 people. The median household income is \$53,126 and median age is 42.3. 13.7% of the population identifies as a visible minority.

**Description:** Victoria Makerspace is an independent, member-operated shared space for collaboration and sharing tools and other resources. The space is geared toward adult makers with some experience who are looking for access to tools and space to complete projects. Victoria Makerspace also serves as a venue for community events. Members and non-members are able to share information and communicate online through a forum on the organization's website.

**Resources:** The space contains a full woodshop, a full cold metal shop, and a limited hot metal shop. Electronic tools such as laser cutters, 3D printers, and soldering irons are also available.

**Programs:** Victoria Makerspace hosts a variety of public programs, workshops, and educational sessions run by members and partners.

**Pricing Structure:** Membership is required to use the makerspace. Standard membership fees are \$50/ month, with \$30/ month fee for students.



# APPENDIX B: CONSULTATION

## 1. INTRODUCTION

The following report summarizes the results of extensive consultation with Library leadership, staff and Board, stakeholders and community partners, Town of Ajax staff and Council including the Mayor, advisory groups and the general public. The intent of these consultations was to gain greater insights into the needs and wants of the community and evaluate support for a makerspace in Ajax.

Over 800 people were engaged to discuss desired makerspace goals and activities, locations, potential partners and risks and challenges. The key findings identified through consultation will help to inform the type, size, programs, activities and equipment and location of the future makerspace.

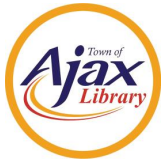
## 2. ASSESSMENT INPUTS

Internal Stakeholders- 18 Interviews  
Community Partners- 14 Interviews  
External Stakeholders- 32 Interviews  
Focus Groups and Advisory Councils- 5 Sessions  
Public Survey- 704 Responses  
Staff Survey- 58 Responses

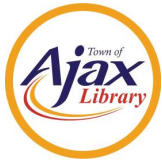
## 3. LIBRARY BOARD AND LEADERSHIP INTERVIEWS

### Goals and Opportunities for the Makerspace

- To foster entrepreneurship and create skills training to broaden opportunities for employment.
- To support small business needs and development.
- To support youth in terms of discovery, development and exploration of skills.
- To facilitate community engagement and support the interest and learning for people of all ages.
- To create opportunities for life-long learning.
- To educate the broader community to find their passion and create opportunities to learn a skill that they might not otherwise do.
- To create a space/environment that is fun and inviting that makes people want to go to the library and continue to return to the library to take advantage of all the library services. Opportunity to expand library services.
- Elevate the library station in the community – move people away from the perception of just a place for books.
- Should be a library-branded space.



- The makerspace should have a circulating collection – makerspace users should be able to check out equipment and tools to complete at home.
- There should be a stationary makerspace i.e. in the library, but should also have outreach programs where it could go out into community.
- To ensure that the space is managed by knowledgeable and qualified staff.
- Unique to Ajax – town of Ajax aspires to be unique in the realm of innovation – they want to improve – to work, learn and live in Ajax. (i.e. initiatives like Innovation village)
- A place to access tools and equipment beyond 3D printers. Should have C & C machines, large format printers.
- A forum to invite professionals to talk about they do.
- VR space – VR escape room – offering opportunities for VR. Opportunities for safety training, senior mobility armchair travel.
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- A forum to invite professionals to talk about they do.
- VR space – VR escape room – offering opportunities for VR. Opportunities for safety training, senior mobility armchair travel.
- Encourage exploration, tinkering, and play
- Bring the community together. It important to be a place to share knowledge – multigenerational. Kids can teach older adults, older adults can teach kids.
- Should be a place that helps to develop soft skills – teamwork, problem solving, communication, critical thinking.
- Ensure the library/makerspace is addressing the diversity of the community.
- Should be open and accessible to the whole community of all age groups, with a focus on kids – Grade 2 -12 - and STEM learning.
- Clarity in offering and creating a welcoming space.
- Spaces should be open, bright, and inviting. Provide equal opportunities for those with different interests. Enough space to accommodate groups and families without feeling overwhelmed or overcrowded.
- Engage the community as a whole - not sure if seniors would be interested, as they want to do more social things.

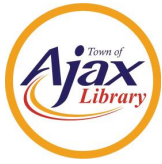


### Activities and Equipment

- Audio/video production (including cameras, green screen etc), sound recording, and animation
- STEM learning activities esp. coding
- Book printing for self-publishing - people telling their own stories
- Woodworking
- Pottery studio, digital art software, video game development software, knitting, sewing machines, button making, quilting
- Laser cutters, C & C machines
- Chemical labs
- Musical instruments – creative outlets
- Robotics – should have a club and compete internationally.
- Technology is very important, but also important to do things with your hands.
- Kitchen space – learn to cook. A kitchen can help people make the right things to put in their bodies. Durham region has highest rate for diabetes in the province – Ajax was the highest

### Optimal Location for a Makerspace

- Could be in a library branch or other town facility ( must be Library branded and managed). Should not be in a standalone building/site. Although the possibility of retail space/ strip mall is intriguing, ultimately would prefer to be in library or city space.
- Old village Pickering branch and old courthouse similar location (Sherwood/ church street) village arts centre is an interesting idea. It is next to high school and grade school and hockey arena. Unclear about its future as a development opportunity.
- Mobile makerspaces are where the programming opportunities are. The idea of people coming to us are good, but there's better value going to them. You can reach more people that way. Programs augmented by the ability to take things out.
- Audley branch – has a meeting space and access to the town's banquet/ meeting hall. Main branch has the rotary room which could also work. Best to be part of a recreation/community centre – captive audience. It is also the newest branch and serves the largest population – where the growth is. A more diverse population. A lot of unused space.
- *Maclean* is the smallest branch – gives the library an opportunity to grow. Within a community centre – ample parking, bus route, relatively central. Gets the most traffic.
- If the makerspace is located in the library, shouldn't need a library card to access the makerspace.
- Main branch - not a lot kids frequent that branch but there is a lot density being downtown.
- Location doesn't matter, people will come wherever it is located. Ajax is a small city.
- Should be in a recreation centre.
- Should consider a Durham district school as a location/partnership.



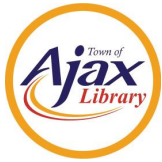
### Success Factors

- Percentage of cohorts involved, number of schools participating.
- Impact on people's lives or businesses, families, etc. Cross generational value.
- Relevance in the community.
- Increase membership to the library
- Longevity - having something that is used and grows, develops and expands.
- Programs that can evolve. Adaptable and nimble.
- Stable funding.
- Useage - an excitement that builds around providing the community with a creative space. Brings like-minded people together and provides them a space to do projects. Open to others who can have a group that helps them build their skills. Opportunities for peer knowledge sharing.
- Attendance and use – regular foot traffic. Diverse and unique visitors. If people come and use it, that is success. High engagement use.
- Visitors per hour metric – a bottom benchmark of 10 per hour. And that is for the village branch library. It might depend on what space its in
- Minimum threshold would be daily use, at least weekly use for all the equipment. Don't want something that is purchased to just be sitting there.
- Community embracement
- Did people have fun?
- Generate enthusiasm
- Enriching students - extension of what is at school
- Space that is actually used – make it a destination point – something that they cant get anywhere else.
- Helps with social skills, collaboration, critical thinking - soft skills

### Risks and Challenges

- Sustained operational funding – financial viability
- If you build it, they won't necessarily come. Need to go with the flow with what we are doing, making a less regimented process. Makerspace will always get senior and young kids, but getting teens and adults will be the win.
- Finding a space – difficult to establish and how it can be shared with the Town.
- Operations - Who will conduct classes? How will it be staffed? What will the level of supervision be? How will it operate within staff job descriptions/structure, union, etc.
- Hours of operations – will it share same hours of library (if located in library). Need to find hour that meet the needs of the community. There can be different times for different audiences. Defining audiences, then targeting services to them.
- There might be some legal risk or liability concerns. Potential for injury, especially with machines.

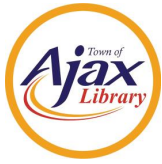




- Lack of awareness. Need to communicate what a makerspace is and promoting.
- Lack of useage- buying expensive equipment upfront and then ongoing use.
- Setting the right path for residents of Ajax
- No other department can take this on other than the library - other priorities for departments
- Navigating bureaucracy.
- Hurdle of language and culture in Ajax
- Maintenance and life cycle of the equipment.
- Demonstrating the need for increased staff, recruiting for that role, finding the people and develop core competencies.
- Noise separation from other spaces, ventilation.
- Expectation gap
- A number of stakeholders trying to satisfy
- Ensuring the space is sufficient and adaptive. Planning for technological obsolescence, continuous review to change, add on, and adapt.
- Salvation army is currently putting in a community kitchen. Don't want to compete with other community groups, but support them
- Being mindful of other libraries in the area, don't want to duplicate but complement other libraries.

### Potential Partnerships

- All different community groups, cultural groups, reflecting the diversity of the community and opening for opportunity to involve all of the community
- School boards and education, other school agencies. Could help them out to fulfill educational requirements. Or could have program that is less limited with big classes partaking in different activities.
- Town of Ajax - Economic Development
- Universities and post secondary institutions - Ontario Institute of Technology, Durham college
- Corporations, local companies to sponsor ie Gordon foods, Best Buy, Staples, Home depot. Whether that's a named space or a monthly rotating partnership (possibly with themed activities).
- Local sewing groups, craft guilds, artisans, creators to teach and volunteer.
- Local schools to support curriculum. If there is s STEM focus, partnering with Ontario tech or Durham college. Support for resources or staffing.
- Could partner with local agencies like Grandview and community living to see what they want to see in the makerspace.
- Local restaurants, chefs to demonstrate.
- Community groups, social service agencies, business associations, senior centres
- Not a limit to partnerships, a whole host of potential partners on different fronts. Fulfilling something for the community in contributing and having purpose. Helping older folks contribute to



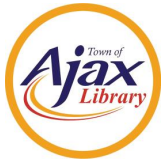
society. Offer opportunities for people to be participants or leaders. The makerspace as an inter-generational community hub.

- Promote to employment centres to upgrade skills

## 4. TOWN COUNCIL INTERVIEWS

### Goals and Opportunities for the Makerspace

- Makerspace should be broad-based and open to everybody – people of all ages.
- Ajax must get youth occupied through creative arts, digital arts in particular and STEM applications. There is a niche for this right now. Ajax doesn't realize it needs it right now. It is on the edge of everyone's lists.
- Youth and teens want to be content creators but they lack a lot of the foundation – makerspaces can fill that gap with equipment and instruction.
- Important that skills are transferred – shared knowledge – young to older and older to young.
- Soft skills are important as an outcome of the makerspace.
- Technology should be an important part of the makerspace, but not the only thing.
- Makerspace could be part of the Innovation Village concept for downtown Ajax. Innovation Village still in an early concept stage, but the makerspace could be a first stage of getting teenagers involved in technology and then graduate to Innovation Village.
- Makerspace could also provide opportunity for people to fix and repair things ie bicycles
- Hoteling spaces could be an interesting part of the makerspaces – places to conduct business.
- Support from Town Council has been communicated by all Council members – very important to help move the project forward.
- A makerspace will enhance the goals of council of being of service to our youth.
- Artistic innovation. Art for arts sake.
- Importance of the on-site training programs for those learning how to use the space.
- There is so much potential – need to continue to think outside the box.
- Important that the makerspace reaches the town's youth -in particular at-risk youth.
- Seniors are also an important segment of the population that must be addressed by the makerspace.
- Place to jam for musicians
- Important for kids who are not university or college bound.
- Could serve as an economic round table where professionals and business people to come together.
- Must be welcoming and safe space for all residents of Ajax.



- Must be flexible – room to grow, change up equipment if needed, be able to respond to needs of the community.
- Must work with Council to get this off the ground and get approvals for funding.

### **Activities and Equipment**

- Shop and electrical
- Teaching simple home skills, fixes and repair
- Culinary

### **Optimal Location for a Makerspace**

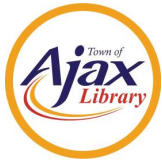
- Should be in the library and Audley is the most likely location. Main branch is also good option.
- Existing libraries are pretty full, the Town has municipal spaces that are not being used. Could be looking in Pickering Village.
- The old firehall could be a location for a makerspace, it is going to be used for cybersecurity training.
- Main library has some meeting spaces that could be used.
- Some Council members did not like the mobile idea.
- Has a greater possibility of growth if located outside a library. Could start off in the library and then it could move and be part of the Innovation Village for example.

### **Success Factors**

- The impact that it has – encourages young and old to learn a new skill.
- Creating a sense of community – providing a service for people
- People being excited
- Attendance and use - balance between cost and use.
- Results
- If you can rescue one kid, then you have succeeded. Cannot put a price tag on that.
- If you help a lonely senior, giving them a place to go and learn, then you have succeeded.
- The advantage of being part of the library is we don't need to offer it as a success or failure, it is a success by expanding our resource offering for the library and future proofs us. Building it will be a success unto itself.

### **Risks and Challenges**

- Capital and operating costs.
- Funding – who is going to fund it – is it a good use of taxpayer dollars. Hard to go back to taxpayers in the current or in near future climate.



- It is a problem building it now. Ajax will need to recover financially from the pandemic - makerspace is a "nice to have" not a "need to have." There are other municipal priorities that should take precedent.
- To have good community partners
- There is a political cost if Ajax doesn't go ahead with this makerspace. If we want to be a progressive community we need to create opportunities such as the makerspace. Need to lay a foundation for future generations to utilize this. 98% of the work is building it, and then programming and upgrading it.

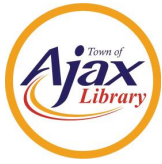
### **Potential Partnerships**

- Community colleges - very successful classes in Whitby
- Arts community
- Corporations and local businesses - should include opportunities for naming rights. Need to be reaching out to every tech company- we need to think about general dedicated income that can help the program to offset expenses and keep costs down.
- Ontario Power Generation - Amazon great community program, Alexicon - hydro utility. Logistics companies.
- School board has to be a partner - schools know about the at-risk youth. It is our responsibility to look after these kids.
- Police and fire departments
- Social service organizations and community groups - needs to be diverse and representative of the community.

## **5. TOWN STAFF INTERVIEWS**

### **Goals and Opportunities for the Makerspace**

- Makerspace needs to be accessible - need to get people to come. Needs to appeal to a large demographic - cultural backgrounds, age etc.
- Needs to have accessible hours of operation - not necessarily library hours (if in the library). People want to work off hours.
- Should be multipronged and multigenerational - kids, parents and grandparents. There is potential for an older adult type audience for after and pre-retirement adults.
- Multipronged target market- young adult entrepreneurship demographic that is out there - lots of people with great ideas who need a space to go to experiment - one type of work space.
- The young adult audience could be 18 or even younger up to a 30-35 age range. There needs to be technology to meet the needs of the younger demographics- 3D printers, tablets, Smartboards, and other equipment.
- Needs to be staffed - requires facilitators to engage with users and provide instruction on equipment use. Should also think about mentoring opportunities.



- Space should be flexible to allow for different kinds of equipment and activities.
- Needs to have good internet connection.
- Should be a casual, comfortable space, people should be able to eat their lunch.
- The Town has been working to create a brand for our community around innovation, a maker space would be an important space for contributing to that brand and the reality of being an innovative community.
- Makerspace should contribute to placemaking – create a unique and authentic place and experience.
- Create spaces where racialized and marginalized communities can feel welcome. Often these communities feel uncomfortable going to Town-owned facilities.
- Important place for retention – encouraging people to stay in Ajax, after high school or after university.

### **Activities and Equipment**

- Team building and training opportunities – cybersecurity.
- Test and working kitchens
- Woodshop, sewing machines, the potential for pods for independent work, and collective space as well. Recording booths/editing suites

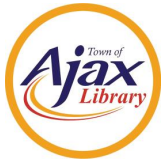
### **Optimal Location for a Makerspace**

- A community centre or a library – main branch closest to Town Hall, lower income neighbourhood. Might be more accessible than others.
- Needs to be accessible by public transit in an existing facility.
- Town in the middle of a parks and recreation plan – could be a new community centre.
- Pickering Village could be a good fit.
- Ajax Community Centre – there are plans for potential renovation. There is no room at Mclean.
- The Old Mill and Fire Hall could also be opportunity for a unique makerspace. Central location is important.
- Mobile makerspace could work but it would depend on a number of factors – parking, weather, operations and staffing.
- Could be a combination of both fixed location ( ie library) and mobile.

### **Success Factors**

- Usage – if lots of people are using it
- Should do follow up analysis to measure success, impact and “joy” – a satisfaction survey.
- Is it meeting the need. Need the numbers. Budget is a measuring stick. Customer feedback.
- Getting young people to stay is changing the narrative.





### Risks and Challenges

- Not communicated properly
- Setting and meeting achievable goals and expectations.
- Multigenerational spaces can be both a benefit and a barrier to participation. Do teens want to be sharing space with older people. Do older adults want to be in a space with teens.
- Be careful to not duplicate services and programming from other Town departments. Important to coordinate and complement services and activities with other departments, Recreation, Culture and Community Development in particular.
- In the short term COVID restrictions
- Ensuring spaces are properly fit out to accommodate equipment such as adequate power, ventilation, noise separation, Wi-Fi and others.
- Having sufficient capital costs to build out the space and sustained operating funding.
- Should look at Ajax's Open Space to make sure no duplication. Possible partnership opportunity.

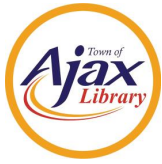
### Potential Partnerships

- Town of Ajax, Community & Cultural Development – Robert Gruber
- Local schools - high schools and grade schools
- Youth Advisory Committee
- Senior Centres
- Durham College
- Ontario Tech University
- Ajax Fire
- Community user groups
- Manager, Community & Cultural Development at Town of Ajax
- Fee for service organizations
- Durham Tamil Association, Chinese Community Association, Canadian Pakistan organization – they are connectors to their own community.
- Scientists in School- interesting group to talk to. They go into elementary schools with hands on science programs. Hands on science education.

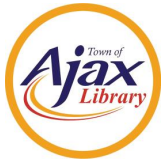
## 6. STAKEHOLDER INTERVIEWS

### Goals and Opportunities for the Makerspace

- Building new skills for people
- Allowing individuals to explore interests that they may not have access to before. Giving people the ability to explore hobbies and interests and express themselves creatively and develop confidence in their abilities.



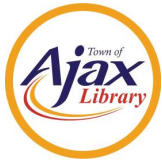
- Users have to feel welcome regardless of ability – physical and intellectual - and experiences people. Reduce stigma, eliminate barriers. Space needs to be accessible. Giving people an opportunity to be together.
- Needs to be inclusive and reflective of a diverse community. Families of different programs want to participate, but also want to feel included and welcomed. Better to be for all ages, as lots of families have kids of varying ages - accessible to all families. Ensure marginalized and underrepresented communities are served. Black youth are underrepresented in STEM.
- Makerspace must have equity of access for all users – more exposure and opportunity for all.
- Should also focus on lifelong learning, reaching multiple generations.
- Making families feel welcome depends on the space, but things like language accessibility can make people feel comfortable. Simple registration (via email or call), clear direction, time of day (weekend, after work).
- Needs dedicated, qualified staff. Programming is critical. You can buy equipment but people have to know how to use it.
- Learning to code is very important – coding is a literacy skill, a language. Important for girls, black youth and Indigenous.
- Broadest goals should be along the lines of education and building awareness in the community of the types of skills that people can develop in Ajax and keeping them aware of new and old technology and skills. And how to get people to use the tools creatively.
- Technology is relatively inexpensive, libraries can build awareness and stoke curiosity and build skills. Helping with curiosity and awareness for solutions and problem solving with technology.
- Could look at innovations in the food sector – tech, hospitality and cuisine.
- Bridging some of the gaps of the education system in making people aware of what they are capable of that used to be the realm of just professionals.
- Makerspace needs to be a space to test things out. A place where youth/teens can build and fail. If it breaks, they can redo it. Its about problem solving – soft skills.
- Makerspace must be considered a “program” not a “service.” Should be a mindset. Plan the intentionality to guide the creativity. School is based on curriculum– don’t have to cover that in a library. Make the makerspace should offer the passion, the flexibility and the know how. Create a “space that inspires.”
- Makerspace must give youth an outlet to explore their interest and create. A way to spend their time outside of school and a reprieve for the stresses of everyday life.
- Ajax is a bit late to the game on this – the disadvantage is that the library is late to the game- there is an opportunity to learn from the other libraries who have already been doing this work and “leap frog” them in terms of what they are offering. What is the point of differentiation.
- The pandemic has created cause for concern that kids are lacking from real interaction, and virtual programs are not the same. Ajax Community Centre has pick-up services - especially for low-income families who don’t have access to materials.
- Must understand the makerspace landscape in Ajax – 50% of schools have makerspaces.
- Space needs good connectivity – could be sponsored.



- Spaces should be designed to be casual and inviting for teens – sofas, foosball tables. Creates space for exchange – making community. Cannot be a quiet place – if in the library, makerspace should be isolated from the rest of the building.
- Many high schools in Ajax have 3D printers and CNC machines. And the high schools are having issues attracting students to their robotics clubs, electric car clubs etc. Kids are using technology all the time and they don't know what to use it for- the kids who seem the most into this are the younger grades. So the technology could perhaps be more for younger kids and more hands-on making equipment for teens/high school - glue guns and button makers.
- Teens would be interested in green screens and audio/visual equipment.

### Activities and Equipment

- A "how-to corner" focusing on various topics i.e. Gardening, diy decorative products, cooking (esp. iconic dishes of different cultures) simple construction projects (i.e. putting up drapery rods) Focus on simple things.
- Photo centre- printing and digitizing older content.
- Graphic design program- specific to creating a certain outcome (pamphlet, flyer, business cards) this would be especially useful for small businesses
- Large scale printing
- Ideas related to COVID and getting through the pandemic. Art, painting, digital creation for all ages. People working through their experiences
- Tools or certificates in photoshop, robotics, computer programming
- Crafts, games, working towards technological goals.
- Opportunities for woodworking. Lots of different interest areas, but something youth could work on to develop confidence in themselves and self empowerment.
- 3D printers - not all schools have them.
- Sewing machines- not everyone has access or knows how to use- allows many people to get involved. Easy to use but allows them to be creative.
- Makey makey" - invention kits using everyday objects - cheap and a first step into design with electronics.
- Arduino – Open-source electronic prototyping kits
- 3D printers are a necessity- PLA layer by layer, SLA printers are getting cheaper, but they are cumbersome need ventilation.
- Glowforge – In-home 3D laser printer.
- 3D scanner systems
- Computing towers – gaming computers
- Raspberry Pi -computing and digital making kits
- Media room – run a podcast
- Dash robot kids



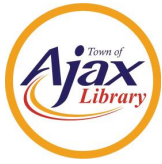
- Inksmith – online course

### Optimal Location for a Makerspace

- The library is there and established. Main branch and Maclean are popular and well used locations. Gets lots of traffic, but maybe doesn't have the quiet environment of the library.
- It would be nice if there was a physical "headquarters" at the main branch, but it would be fantastic if there was a mobile option to serve those like seniors communities, high schools. A physical place and a mobile unit.
- If they can cover the 3 existing branches that is good. Or a pop-up location at other facilities i.e. Ajax community centre
- The library is very accessible for most people, they know where it is and how to get there. Ajax hub that is attached to the library. Mobile sounds really cool for those without a means of transportation.
- Mobile would be difficult depending on the equipment requires calibration e.g., 3D printers, will go off if you are moving it around. Some things can be use in mobile spaces.
- Community centres could also be a good space, as people gravitate towards those areas.
- Mobile units are a good option to go to schools ( in addition to a permanent hub) – bring materials or lessons place to place.
- McLean or Audley- Mclean being more accessible by public transportation, and generally perceived as further away as well. Mclean unfortunately has the most existing space issues.
- Public transit accessibility is very important.

### Risks and Challenges

- Challenges would depend on how much space is available and budget.
- Risk would be insurance and liability
- The pandemic. People are going to be hesitant about being together in physical space for some time. Knowing how to navigate events and get people excited about going out again.
- Need to make sure everyone feels welcome regardless of background. Don't want to have the space too focused on a small audience who then alienate others.
- Language barriers.
- COVID, whether people can access when it is put in place. Not getting the word out quickly and people not using the space.
- Need to get the right people for staffing who know how to use the hardware and are trained to use it and maintain it.
- After hours access – being staffed for those hours.
- When introducing anything new, there is some startup time. Takes a lot of work on the front end of things.
- There may be a barrier in that there are less people with the skills and interest to use the more advanced technologies.



- Any charges to recoup costs ie materials can help but also creates a barrier.
- Physical access

### Potential Partnerships

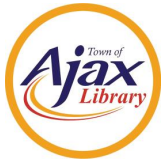
- Schools in Ajax – makerspaces and libraries
- Community organizations
- Local colleges, Durham college also has really interesting programs that do maker stuff.
- University - engineering department does a lot of creation and innovation they have their own maker spaces in their labs.
- Robotics and robotics clubs -
- Employment centres, local community centres, mental health organizations, Carea Community Health centres, Kinark Child and Family Services, local police community.
- The library already has a pretty extensive group of partners including school boards.
- Retailers such as Michaels and Home Depot could be good partners.
- Tech companies such as Johnson Controls, Safran Landing Systems and other similar companies in Ajax.
- Rotary Club of Ajax
- Sewing clubs and groups
- Ontario Technical University and Durham College
- Ontario Centre of Innovation, Communitel in Waterloo
- Black Boys Code
- Tech Spark – Canada’s first tech and design school committed to empowering children of colour, girls, women and teachers through innovative education.
- Ajax theatre companies
- Local youth council, should be a committee appointed from within the Town – a designated representative. Town should provide leadership training.

## 7. COMMUNITY PARTNER INTERVIEWS

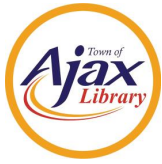
### Goals and Opportunities for the Makerspace

- To help the individual maker succeed in whatever endeavor. Let people develop skills they might not even know they have. They can try different things. Build self-confidence and self-esteem. Youth and adults alike. Reveal competencies they have that they didn’t know they had
- Provide help with actualizing ideas to life.
- A makerspace where other creative people, like minded thinkers can be brought together to help each other succeed.





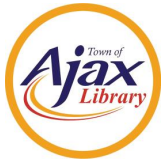
- Need to create opportunities for kids to become creators, not just consumers.
- In addition to tools and equipment, people must have access to information – knowledgeable staff who can help and facilitate.
- People should be able to borrow tools.
- Hours that extend beyond regular library (if in a library) are really important.
- Makerspace could serve as a coworking space – a great drop in centre.
- The makerspace has to be accessible in every way. Physical, intellectual and social accessibility. Language is a very big part of that – especially for newcomers.
- Needs to be an equitable space, open to all.
- Needs to be welcoming space – particularly newcomers. Can be a cultural bridge. A way of introducing newcomers to Canada. Lots of creativity in the newcomer population newcomers are coming from all over the world bringing skills traditions and the assets of their cultures and traditions to Durham.
- Like the library, makerspace has to provide a sense of community.
- Need to be looking at building and operating through a DEIA lens.
- Must be a safe and inclusive space for the black community. The library needs to reach out to the black community to get them to come. There has to be a diverse representation of staff at the makerspace. The black kids won't come, if there is nobody else that looks like them including staff, volunteers and facilitators.
- Makerspace has to be diverse with diverse partners.
- Can be a direct link to employment. Support programs and services to help people get a job. Especially for newcomers who have a lot of skills and the makerspace could give them ideas of how to channel their job search.
- Makerspace should also encourage and promote entrepreneurship in addition to supporting employment. Young people want to focus on being entrepreneurs, and black entrepreneurs in general would benefit.
- Should be a balance of having and identified a product or outcome ie employment and a place where people can explore things when they want to. An opportunity to socialize and grow through creativity.
- Makerspace could be a resource for small businesses.
- Makerspace should exist physically virtually. Provide access to participate virtually.
- Space should be flexible and nimble. Things should be dynamic. There are always emerging issues. Plan and design for evolving and new technologies as things change.
- Learn from what already exists and is successful. Look for emerging trends that will give the library opportunities for the future rather than focusing on just problem solving. Partnerships and collaborative efforts are the way to go.
- Must make sure there is equitable way of accessing the resources – making sure that the vulnerable feel welcome and are not marginalized.



- Communication and messaging have to be clear about what the space is all about. Language has to be inclusive. Use social media to communicate, but in a way that works for kids. Kids don't engage with library social media content.
- Think outside of the box to reach communities ie Brotherhood United Mentorship Program. Communicate information through trusted sources including group leaders and local community organizations.
- Get the schools involved but ensure that black kids specifically within the school are involved. Work with the black student associations.
- Makerspace could provide apprenticeship programs or certification programs on certain activities and endeavours.
- An opportunity where people can create music, incorporate cultural artifacts, incorporate community creation.
- Getting girls engaged in STEM should be top of mind, especially for the black community. There is a challenge with getting kids engaged, but they could be engaged through school boards, social media, student groups.

### Activities and Equipment

- 3 D printers - very important for prototyping
- Crafts for kids
- Sewing and textiles.
- Audio/video recording and production equipment.
- Recording and editing studios - You Tube and Podcasting
- Access to screens or projectors to do demonstrations.
- Robotics is an important skill for people youth and high school.
- Woodworking, metal working and electronics, these are good supports that would help newcomers join the labour market.
- Digital Resources- support in terms of devices- computers, internet connection. Provide basic computer literacy and advance software to develop and work within their own and time and space.
- Hands-on building, cooking and gardening
- A space/gallery to show the results of created work or experiments.
- Activities kids can do by hand - that have an end result.
- No long-term projects, something kids can do in one session.
- Kitchens would be important for Ajax - would be great training for kids. Could be part of a garden - tie into food security.
- Makerspace could also include the production of plays - learn about many cultures. Other creative outlets could include poetry, writing, visual art.

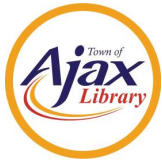


### Optimal Location for a Makerspace

- Pickering Village - adjacent to the proposed Innovation Hub, easily accessible to GO and Durham transit.
- Main branch makes the most sense – good, central meeting space.
- Community centre would be perfect.
- Combination of a permanent space and a rotating mobile element that could travel throughout the region.
- Seems to be a lot of vacant spaces in the town - might be nice to bring some life to these space with makerspace and workshops. A storefront would be good. Kids could ride their bikes, look in and see what is happening. Might be a different way to approach communities.
- Pop-up space is another opportunity - restores community involvement and community feel
- Accessibility is very important. Patients use public transit, so anything accessible that way is a plus. Community centre could also be a good space, as people gravitate towards those areas.
- If in the library - shouldn't be an isolated space. Should be part of the stacks and the rest of the activities in the library.
- Mobile sounds very interesting- you may get more of the community coming out to a mobile facility. If there is a mobile space you might get an entire family coming out - it's informal, you don't need a membership card. A permanent space could get crowded.
- New library at Audley might have more space to offer and it's part of a community centre and easily accessible.
- Library may have some limitations for space but also support. Library may not have skills to support in that environment.
- Would like to see it in a library, as that space has so much to offer (books, magazines, etc). They may engage with other parts of the library. Engaging young kids in reading, especially black kids.
- If the library works on making it an inclusive space for black kids, it could have many benefits.

### Risks and Challenges

- If you build it and no one wants to use it.
- When introducing anything new, there is startup time. Takes a lot of work on the front end. Might be challenging to build it during the pandemic.
- People are not interested if they can't access easily.
- Risks of not returning borrowed tools.
- Need to put in regulations. If you want to participate you have to abide by the rules. So that everyone feels safe.
- People have to be taught to use the resources and users need to accept what their responsibility and liability could be.
- Security not just for equipment but for the people coming to the space is important.



### Potential Partnerships

- The Business Advisor Centre of Durham would be an excellent partner because they have a lot of people who can be paid mentors, some of those folks are members of the Board of Trade.
- Ajax Pickering Board of Trade, Restaurant Council. The money is at the banks and insurance companies – could be sponsors.
- Colleges, universities, Muslim education group in Durham school board.
- There are definitely businesses that connect well to the maker movement- local knitting shops – Ajax Textile is a big manufacturer. There are definitely businesses that would participate if approached as the municipality has positive relationships with the town. Need to make the ask but most of them would be willing to help and support.
- Ajax’s primary and secondary schools will be important to talk to.
- Employment centres and offices, community centres, settlement organizations, mental health organizations, Carea community services, Kinark.
- Continuing Education programs at the schoolboards- there could be a gap filled by the makerspace
- Black Physicians of Tomorrow, Durham Black Educators Network (DBEN)
- Durham parent advisory council
- Ontario Technical University

## 8. FOCUS GROUPS- GENERAL COMMUNITY AND YOUTH

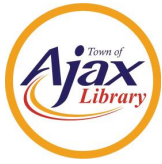
### 8.1 General Community Focus Group

#### What the Focus Group Liked

- Woodworking tools
- Participant didn’t know what a makerspace was, but sounds like a lot of high schools could use the facilities as high schools and young 20s don’t know much about making
- The oven was cool, lots of people are getting into cake decorating.
- Interested in taking woodworking, a lack of introductory classes
- Didn’t think of wood and metalworking because of liability issues, but being able to use these tools would be something I support
- Young people don’t always have practical hands-on experience

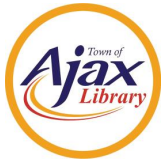
#### Goals and Opportunities for the Makerspace

- A course on use and maintenance of 3D printers
- Whenever my community is making a community space, I want that space to in its mandate create community. It is nice and important to have access to facilities and staff, but that is not enough.



- To create and invest in a space, it should be a place that creates community, togetherness, and cohesion in the community. The space offers even more value through sharing skills face to face.
- Bike repair options
- For kids today, access to home economics and hands on classes today is limited. Kids should be exposed at a young age to hands-on activities
- The modality is less important than getting young minds to physically touch and produce things, which is absent today.
- Kids are able to innovate without an instruction manual.
- Curious about the process by which the type/ resources is determined. Supplement existing offerings, beyond just need but what will be useful
- High school student interested in STEM and even though it is offered, it doesn't necessarily mean its accessible because of time so it would still be valuable if there are overlaps.
- Should definitely be introducing the idea of upcycling to young people who will learn it and carry it on.
- Should be a sustainable space - is as important as building community.
- Mistakes from other makerspaces: it needs to have open hours; it needs to have equipment diversity.
- Creating something specifically ajax: an audiovisual studio reporting on something Ajax specific, a quilt that is culturally significant and topical
- For the community, by the community
- Group-based or having a volunteer there, the ability to ask other users. Opportunity to share materials i.e. leftover fabric
- Would love to see a multigenerational space, that would achieve a lot of things. People can ask each other for help
- Also agree about it being multi-generational. Maker-style projects can be intimidating to younger people but attempting them can be a valuable learning experience. Keeping it multigenerational inspires young folks.
- Inclusive, but with different time slots for activities or groups
- Spaces that are specific for certain types of use or individual work (i.e.. practice rooms for music, then folks come together) Why not have different areas in a makerspace for different stages of learning or categories of age.
- There is interest in lots of different activities, but it make the approach and intention more important. What are the goals? How do we use it? If there is a facility without intention it can be led wherever. A mandate that is clearly communicated to all groups is critical
- Would like it to be in a friendly place, like a library.
- I would also want it to be visually appealing or welcoming, a friendly looking pace.
- A warm and welcoming atmosphere.
- There are businesses that might be interested in sponsoring





- Support the concept, but people should be encouraged to repair their own devices, but a major tech company might be against repairability
- Different approaches to sponsoring: either one business, or a community donated (a wall, a piece of equipment)

### Activities and Equipment

- Half the group liked artistic, visual or fine arts, the other half preferred fabrication or 3D printing
- Kitchen in the makerspace - a natural fit, not everyone understands chemical engineering but people understand cooking. Opportunity to share through food
- Community garden would be really cool. In the kitchen, having other people to help you
- Accessibility to tools would be really interesting

### Optimal Location for a Makerspace

- Most preferred location to be in an existing library branch – Mclean branch, part of a community centre and has audience of all ages.
- Accessibility through biking and busing, but Ajax Go station is surrounded by vacant space, but if cost allows a space like that would be accessible by public transit and have good square footage availability
- About location, probably important to consider where population density is. (Ex near new buildings)

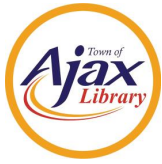
### Risks and Challenges

- If the space was clean or not noisy, too many children running around
- Barrier would be restrictive rules on equipment use. If every tool requires an application and demonstrating ability. Equipment breakages need to be factored in
- Distance would be a barrier. Needs to be in Ajax, as other offerings for interesting programs have required traveling.
- Getting a library card may not be a barrier, but sometimes cards expiring is annoying
- Not easily accessible – lack of parking.
- If equipment was being loaned, would be annoying if it wasn't available when someone goes to the library.

## 8.2 Youth Focus Group

### What the Youth Community Group liked

- The variability of what a makerspace could be, the scope of just how big and varied they could be
- Different spaces for older youth and younger youth. Don't mind there being lots of people, but little kids might get in the way
- Free to many people and community based which makes it nice



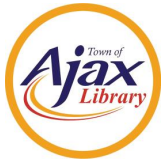
- Versatility gives everyone in the community an opportunity to try new things

### Activities and Equipment

- Green screen was cool, have had to do school projects with filming and didn't know where to go
- crafts and learning new hobbies
- Coding and programming, learning languages like python would be really cool
- 3d printers would be great
- Anything visual arts, drawing
- Need an instructor to supervise, not a class but more informal
- Good to learn a life skill - learn to fix things - we throw out things that don't work. It would be beneficial to be more environmentally friendly. It would be a good life skill to have
- Sewing is cool, a good skill to learn.
- Art supplies, music, drawing supplies, painting
- Computers with interesting software for people to play around with. Coding software and stuff like that
- Scientific creation or lab. Lots of people are interested in healthcare but I don't know where to find resources
- Cardstock or thicker paper to make a card game. Art supplies
- Animation software, drum pads to produce music, apple pens have a thing where you can draw animation
- Green screen
- Most would prefer to experience with a group and teacher. Having a group can make you feel more comfortable and like you want to come again next week. Meeting new people.
- When you share a space with like- minded individuals it makes the experience better and you can ask them for help.
- Interaction is important, so you could say it is a social space
- Meet people
- The social thing is important
- Others ( about 50%) would prefer to experience on their own.
- If I'm comfortable with what I'm doing it can be social, but I need to get the hang of it on my own first

### High-tech vs. Low tech

- The more technology is incorporated into classes, the more unnecessarily complicated the tools or task become. I.e. a biostats course that uses a specific software and there was such a larger learning curve it was not worth it



- Considering that the future is almost going to be highly revolved around technology it just feels really nice to have hands on activities to do.
- Hands- on keeps me connected with the real world and my friends. Being on electronics all the time gives me a headache. Hands on gives me a chance to relax online learning. In quarantine we've all found new hobbies and that helps us relax.
- After quarantine, I would still be down to hands on but before I would find stuff that was really far away
- Considering the future is going to be so revolved around technology, hands on is going to be more useful

### Reasons for Usage

- Mostly leisure, followed by informal learning. Not concerned with future employment or business opportunities

### Optimal Location

- Within one of the three library branches. Audley is most convenient.

### Risks or Deterrents

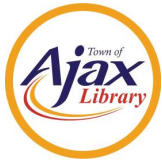
- If it's super cluttered or there's a lot going on at once. Some kind of organization would work
- Disorganization
- Something we aren't interested in
- Super unorganized, stuff is all over the place and messy. People are being too loud and not really trying to make
- if it was constantly full of people and really busy

### Sharing and Co-learning with Older Ages

- That would be fun
- Yes of course
- Definitely
- That sounds good, but if its like too much of an age gap where I'm not sure what they are trying to teach me

### Importance of Being Environmentally Friendly

- Its really important, I'm big on sustainability so that is really important to me. If that's something that the makerspace offers and brings to attention then more people will care
- Small things like gardening, workshops, anything that brings it to people's awareness so they can apply it to their everyday life
- Disposable tools, maybe they should be recycled or there could be limited
- Commitment to resources sourced being sustainable



- Visual arts and crafts, waste can be produced. It can save your budget and be a win-win

## 9. ADVISORY GROUPS- TEEN & OLDER ADULT

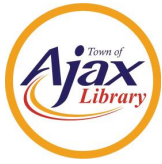
### 9.1 Older Adult Advisory

#### Activities and Equipment

- Knitting, cross-stitch, general support of “crafting and making”, writing, sewing, knitting, cross-stitching, embroidery (looking to expand into woodworking), knitting, gardening, music (piano), oil painting, weaving, general creativity (writing, music)
- Some, not all crafty things. Some folks cannot afford the equipment to do certain crafts so tools would be helpful.
- Woodworking, things like scroll saws or laser cutters. Don’t want to buy the equipment yourself. Cricut cutters
- Media arts. Since the pandemic, people have had to apply for things at a distance. Learning on how to put together a presentation
- Edmonton library had digital conversion of VHS tapes which could be interesting
- Repair cafes
- Musical instruments, how to record music
- Learning activities around creative writing, the arts
- Other activities “getting you started” in something like leather working, playing the piano
- Pottery Kiln
- Computer graphics program
- Gardening- including hydroponics, growing plants from seeds, seed library

#### Goals and Opportunities for the Makerspace

- Community oriented
- Creative
- Inclusive: different dichotomies are too this or this, should be this and that. The sliding scale would energize. Provide opportunities to be collaborative or individual
- Something geared towards special Olympics communities: there are lots of sports programs
- Inspiring
- Participatory
- Curiosity
- Valued: being well used, but also promoted by those who are using it
- Accessible: especially for people in senior communities



- Would equipment be movable to long term care home or seniors' facility? Interested folks who may not be able to get to the library
- Inviting or welcoming: open so people can come in freely

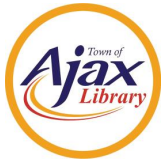
### Optimal Location for a Makerspace

- Most preferred makerspace to be in an existing library location
- Are multiple small locations possible? Different themes at different places.
- Corporate sponsors could offer spaces
- For gardening, there is the Ajax Community Garden which could offer partnership
- Could start in a library facility and expand based on community need.
- Noisy programs might not be right for a library, those could be in a community centre
- Expense may impact choices: starting small and then growing based on budget and need

### Risks and Challenges

- Weather can be a barrier for seniors, particularly in winter
- Transit: accessible by bus
- If the space is too small and you feel squished or like you're on top of other people working
- Accessibility for use: will appointments be made? Or will people have to wait in line?
- Timed use may also be a barrier, limiting what you can achieve in the allotted time
- Concerns expressed around liability, especially for volunteers.
- Don't want to encounter chaos, want things to be orderly
- Classes need to be clear what participants will get out of it
- Raising expectations can lead to frustration. Before investing mentally in the space, want to know more about the budget. How to best use the commitment?
- Ideas about starting small and building on it, building a simple pilot space. Concerns about obsolescence of equipment, especially technological equipment. Mobile spaces can also have additional expense.
- Starting small would allow library to gauge interest
- How will it be promoted? Spreading word will be important to use
- Think about proximity to Pickering and Whitby
- Not sufficient equipment to do project
- Not enough people for instruction to be effective
- The space is too small and uncomfortable





## 10. KEY FINDINGS AND CONCLUSIONS

**Support:** Consultation findings revealed wide-spread support for a makerspace in Ajax amongst stakeholders, community partners and Town Council.

**Audience/Users:** the makerspace is intended for the whole community. It should be broad-based and open to everybody. It should be multi-generational and appeal to Ajax's many diverse communities. While the makerspace is open to all, the activities and equipment are focused on youth and teens.

### Goals:

- To facilitate community engagement and cohesion and support the interest and learning for people of all ages.
- Foster entrepreneurship and create skills training to broaden opportunities for employment.
- To support youth in terms of discovery, development, and exploration of skills
- Create opportunities for life-long learning.
- Expand library usage and participation

**Accessibility:** The makerspace must be accessible physically, intellectually, and socially. It must be welcoming, inviting and inclusive to ensure equitable participation for all; racialized and marginalized communities and newcomers in particular.

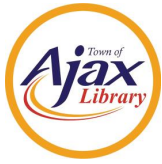
**Communication:** The makerspace must be effectively communicated to the community through the most appropriate channels to reach specific audiences i.e. social media for teens, multiple languages for diverse communities. Messaging is also critically important – the community must understand what a makerspace is, who can participate and what people can see and do. to ensure potential.

**Operations and Staffing:** It is assumed the makerspace will be managed and operated by the Ajax Public Library. The makerspace should have independent (from the library) hours of operation – not necessarily aligning with the library hours – evening hours, for example, are more desirable for many, than morning or afternoon hours.

The makerspace must be staffed with knowledgeable and qualified personnel to facilitate, supervise, and manage. Staff must also be reflective of the broader community of Ajax in which it serves and so it is important that staff include black, Indigenous and/or people of colour.

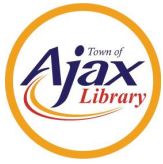
It is anticipated that there will be a wide variety of activities and equipment – both high tech and low tech – in the makerspace. It is not reasonable to assume that staff members will be experts in all these activities and therefore a roster of volunteers and other community members, clubs and organizations could support, develop, and run programs as required or needed.

**Location:** General consensus from consultations was that the optimal location for the makerspace was in one of the three branches of the Ajax Public Library. Main branch and Mclean were the most popular choices. Some thought a mobile makerspace was a good idea, but only as secondary facility to a permanent location in one of the branches. Some consideration was given to Town-owned locations in Pickering Village and other locations.



**Partnerships:** Partnerships were considered to be a very important component of the makerspace from the capital and operating funding, programming and service delivery perspectives. Large corporations with a presence in Ajax, local small businesses, departments within the Town of Ajax, Durham District School Boards and higher education institutions, and community and social service agencies and clubs and organizations are all potential partners for the makerspace.

**Activities and Equipment:** A broad range of activities and equipment were identified through consultation. Everything from robotics, coding kits, 3D printers and audio/video production to sewing machines and woodworking tools was introduced as possibilities for the makerspace. Even kitchens and community gardens were mentioned as potential activity/equipment needs for the makerspace. While makerspaces typically engage in a broad range of activities with a wide variety of equipment to accommodate community interests, next steps will be to determine the balance of activities and equipment for the Ajax makerspace to align with the potential or most likely users.



# APPENDIX C: MAKERSPACE RETROFIT

# Town of Ajax Library Makerspace Retrofit

## Order of Magnitude Estimates (Rev.0)



Prepared for:  
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July 22, 2021

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# 1. Introduction to the Estimate

## 1.1 Project Description

This project consists of the development of a dedicated Makerspace for the Ajax Public Library. The Ajax Public Library currently is comprised of three (3) separate locations; (1) The Main Branch Level 1, approximately 920 sq. ft., (2) The McLean Branch Room#3, approximately 1,440 sq. ft., and (3) The McLean Branch Room#1, approximately 1,435 sq. ft.

## 1.2 Type of Estimate

This Order of Magnitude Estimate is intended to establish a realistic elemental estimate of the hard construction costs based on the level of design information provided. Detailed quantities have been measured from drawings where possible for the proposed building (excluding site). This estimate reflects our opinion as to the fair market value for the hard construction of this project.

The accuracy of the estimate is based on the documentation provided and design stage is intended to be +/- 25%. This accuracy is based on the definition for Estimate Classifications (Class D) outlined in the \*Guide to Cost Predictability in Construction prepared by the Joint Federal Government & an Industry Cost Predictability Taskforce. Contingencies are included to offset the accuracy risk, to the extent that the estimated amount represents the current opinion of the likely fair market value at the time of tender.

The intention of the estimate is not to predict the low bid price received; typically based on historical tender results estimates are more likely to be towards the median value of bids received under competitive conditions. This is a deliberate methodology due to the inherent risk in attempting to predict the low bid and numerous factors which can contribute to lower than anticipated tender submissions which are beyond our control.

\*Reference: [http://www.cca-acc.com/pdfs/en/CCA/Guide\\_to\\_Cost\\_Predictability.pdf](http://www.cca-acc.com/pdfs/en/CCA/Guide_to_Cost_Predictability.pdf)

# 2. Basis of the Estimate

## 2.1 General Information

From the design information provided, we have measured quantities where possible and applied typical unit rates for each of the specific elements based on the project specifications. Where specific design information has not been provided, unit rates are based on historical cost data for this type of project. In some instances where design information is limited, we have made reasonable assumptions based on our experience with projects of a similar scope and design. Estimates for mechanical and electrical systems are developed based on information prepared by the project engineers, historical projects and experience.

Significant changes to the basis of design will impact the estimate value; this is particularly critical where changes are made after the final estimate prior to tender. We recommend that all major design or scope changes be reviewed for their cost, time and constructability impact prior to incorporation in a finalized tender package.

## 2.2 Location Cost Base

The location cost base for this estimate is Ajax, Ontario.



## 2.3 Unit Rates

The unit rates in the preparation of the elemental estimate include labour and material, equipment, and subcontractors overheads and profits. We have assumed for pricing purposes that union contractors would perform the work. We have assumed the fair wage policy would be in effect. The unit rates for each of the elements are based on typical mid-range costs for the type of design, construction, and materials proposed.

Unit rates in all estimates combine the material, labour, and equipment components for a single unit cost for ease of presentation. This estimate is not a prediction of low bid. Pricing assumes competitive bidding for every aspect of the work.

## 2.4 Taxes

Harmonized Sales Tax (HST) is excluded from our estimate.

## 2.5 Construction Schedule

The estimate has been prepared on the assumption that the work will be performed within the timelines of a normal construction schedule. The duration of the schedule would be based on the work being performed during regular daytime work hours. We have assumed the structural components of the building would be constructed in predominantly non-winter months. No allowances have been included for premium time and after hours work associated with an accelerated construction schedule.

## 2.6 General Requirements and Fees

The General Requirements for the General Contractor are included as a percentage of the hard construction cost. This estimate of the prime contractor's site overheads includes site supervision and labour, access to the site, site accommodations, site protection, temporary utilities, clean up, equipment, and other miscellaneous project requirements provided by the General Contractor.

The Fee element of the estimate is meant to cover the General Contractor's fee to perform the work. The fee would be based on the competitive nature of the bidding process and the market conditions at the time of tender.

## 2.7 Bonding and Insurance

We have included the median estimated costs for 50% Performance, 50% Labour and Materials, and 10% bid bonds. These are the traditional bonding requirements commonly requested by the owner. The actual final bonding costs will vary depending on the selected contractors' performance history.

The estimate includes an allowance for general liability and builder's risk insurance based on an average cost per \$1,000 of estimated hard construction costs. The actual insurance costs would be subject to the insurance requirements for the project.

## 2.8 Procurement

It was assumed for the preparation of this estimate that the project would be tendered to a prequalified list of bidders with a project specific lump sum contract. Pricing is based on competitive tender results with a minimum of four (preferably six tender submissions) at general contractor and major trade level. Pre-qualification with a restrictive list of contractors or subcontractors may result in a higher tendered cost due to the inherent reduction in competitiveness. Tenders receiving two or less submissions (occasionally three) historically tend to have a much higher risk of an overrun in cost when compared to the budget established in an estimate. Ensuring adequate bonafide bidders is a prerequisite for competitive bidding scenarios, on which the estimate is predicated.

## 2.9 Specifications

Where detailed and comprehensive specifications are unavailable, we have assumed that no onerous special requirements will be applicable to this project. It was assumed that all materials and equipment could be substituted with an alternative product to avoid sole-sourcing which results in a non-competitive market condition.

## 2.10 Soft Costs

The estimated soft costs have been included in this estimate.

An itemized list of potential soft costs has been shown on the Master Estimate Summary. These costs include items traditionally funded by the owner and separate from the hard construction costs which would be applicable to the contractor. The soft costs include items such as consultant fees; disbursements; project management fees; independent inspection and testing; third party commissioning; legal fees; permits and development charges; operational and moving expenses; financing and loan fees; owner supplied furnishings, fixtures, and equipment; land acquisition costs; and Harmonized Sales Tax.

# 3. Contingencies

## 3.1 Design and Pricing Contingency

A design and pricing contingency of **15%** has been included in the estimate as a percentage of the hard construction costs including the general requirements and fees. This contingency is meant to cover design and pricing unknowns in the preparation of this estimate and reflect the incomplete nature of the design information provided at the time the estimate is prepared.

The contingency where included in our estimate is not meant to cover significant additional program space or quality modifications, but rather to provide some flexibility as the design develops. The design contingency typically decreases as the design progresses and more definition and detail is available to refine the basis of the cost estimate. If the owner anticipates significant changes to the basis of design we recommend additional contingency be retained as a reserve for the scope modifications.

## 3.2 Escalation Contingency

The estimate includes an allowance for escalation. This allowance of is meant to provide for increases in construction costs due to changes in market conditions between the time of the estimate and the potential construction commencement. For projects with a schedule in excess of 12 months, the contingency is based on a timeframe that takes escalation to the midpoint of the construction phase.

Escalation		
Assumed Tender Date	-	Q2 (Apr) 2022
Escalation % per annum	-	4.0%
Total % Escalation	-	2.8%

Escalation during construction is included in the unit rates; essentially this allowance is the risk carried by the general contractor and trades with a fixed price made years before the work is completed or carried out for some trades.

### 3.3 Construction Contingency (Post Contract Changes)

The estimate includes a contingency for the construction phase of the project. This contingency is meant to cover the potential cost of post contract changes that may occur after the project is tendered.

This allowance of **10%** is to provide for increases in construction costs due to Change Orders issued during construction.

This contingency excludes any major program or scope requests by the client; these should form part of an overall project management reserve or be reflected in increased funding.

## 4. General Liability

### 4.1 Statement of Probable Costs

A.W. Hooker Associates Ltd. (HOOKER) has no control over the cost of labour and materials, the general contractors or any subcontractors' methods of determining prices, or competitive bidding and market conditions. This opinion of probable cost of construction is based on the experience, qualifications, and best judgment of the professional consultant familiar with the construction industry. HOOKER does not warranty that proposals or actual construction costs will not vary from this or subsequent estimates.

### 4.2 Ongoing Cost Control

A.W. Hooker Associates Ltd. **recommends** that the owner and/or the design team carefully review the cost estimate report, including line item descriptions, unit price clarifications, exclusions, inclusions and assumptions, contingencies, escalation, and mark-ups. This is to ensure that the design intent is captured within the content of the report. This is especially important at early stage estimates which tend to be based on a lesser level of design completion.

If the project is over budget or there are unresolved budget issues, alternative systems or schemes should ideally be evaluated before proceeding with the design phase. We recommend that cost control be implemented throughout the various stages of the design process to ensure the proposed design remains within the overall budget. It is recommended that the final estimate be produced by HOOKER using Bid Documents to determine overall cost changes, which may have occurred since the preparation of this estimate. The final update estimate will address changes and additions to the documents as well as addenda issued during the bidding process. HOOKER cannot reconcile bid results to any estimate not produced from bid documents including all addenda.

## 5. Estimate Scope Clarifications

### 5.1 List of Exclusions

1. Harmonized Sales Tax (HST)
2. Furniture, furnishings, and equipment (except as noted in the estimate)
3. Premium time / after hours work
4. Accelerated construction schedule
5. Direct or indirect impacts of any COVID-19, or any other pandemic or epidemic, related events whether known or unknown at the time of the agreement
6. Abatement and handling of asbestos and other hazardous materials
7. Handling and removal of contaminated soils
8. Special foundation systems such as caissons or pile foundations
9. Premium for construction management or alternate approaches to procurement
10. Sole sourced equipment or building control systems
11. Security and Communications Equipment & Cabling; estimate includes empty conduit only
12. Media Room equipment
13. Office equipment
14. Modification to exterior wall/glazing

### 5.2 List of Assumptions

1. We have assumed concrete block partition to Library side, gypsum board partition to Makerspace side.
2. Furring to concrete block partition.
3. Acoustical treatment to Media Room door,
4. Resilient sheet flooring throughout.
5. Allowance to repair existing floor where partitions removed
6. Paint finish to expose ceiling, acoustically treated ceiling to Media Room
7. Paint finish to partitions
8. Allowance for millwork and specialties
9. Allowance to modify sprinkler heads, relocate the existing and adjust associated piping to suit new ceiling
10. Allowance for minor modification on HVAC
11. Allowance for modification on HVAC to Media Room
12. Allowance for power to each work station on floor monuments
13. Allowance for ambient lighting in main space and pendant lighting throughout
14. Additional studio lighting on grid to Media Room
15. Demolition of existing conditions as required
16. Option 1: Main Branch:
  - a. Demolition of Janitor Room
  - b. Relocation of Janitor Room (elsewhere on main floor)
  - c. Cap waterline where kitchen counter removed
  - d. Create new door opening to existing washroom and server room to accommodate entry from Library corridor
  - e. Infill existing door openings where single door removed
17. Option 2: Mc Lean Branch Room#3
  - a. Plumbing & Drainage-no work required
  - b. Allowance to remove existing door, infill the opening and create new entrance including new door to room at SE corner of the new makerspace, assumed required
18. Option 3: Mc Lean Branch Room#1
  - a. Cap waterline where kitchen counter removed
  - b. Infill existing door openings where single door removed
  - c. Allowance to relocate existing book drop off box (7'-6"x4'-6")
  - d. Infill existing opening where book drop off box removed
19. Various assumptions have been made based on the design information available and our experience with projects of a similar nature. Please refer to the specific items within the estimate for the detailed assumptions made.

## 6. Documentation Received

Drawings and design documentation were prepared by Lord Cultural Resources:

Pages	Documentation Received	Documentation Issued
5 Pages	Ajax Makerspace.Plans.Insitu.1	July 8, 2021
3 Pages	Ajax Public Library.capitalcostassumptions	July 8, 2021
6 Photos	Main Branch Photos	July 8, 2021
4 Photos	Mc Lean Branch Room #1 Photos	July 8, 2021
3 Photos	Mc Lean Branch Room #3 Photos	July 8, 2021

## 7. Gross Floor Area Summary

The following gross floor areas of renovation construction have been measured from floor plan drawings. The areas were measured electronically with a digitizer and checked longhand by dimensioning and scaling. The gross area calculations were performed in accordance with the Standard Method of Measurement published by the Canadian Institute of Quantity Surveyors.

### 7.1 Summary of Renovation Construction Area

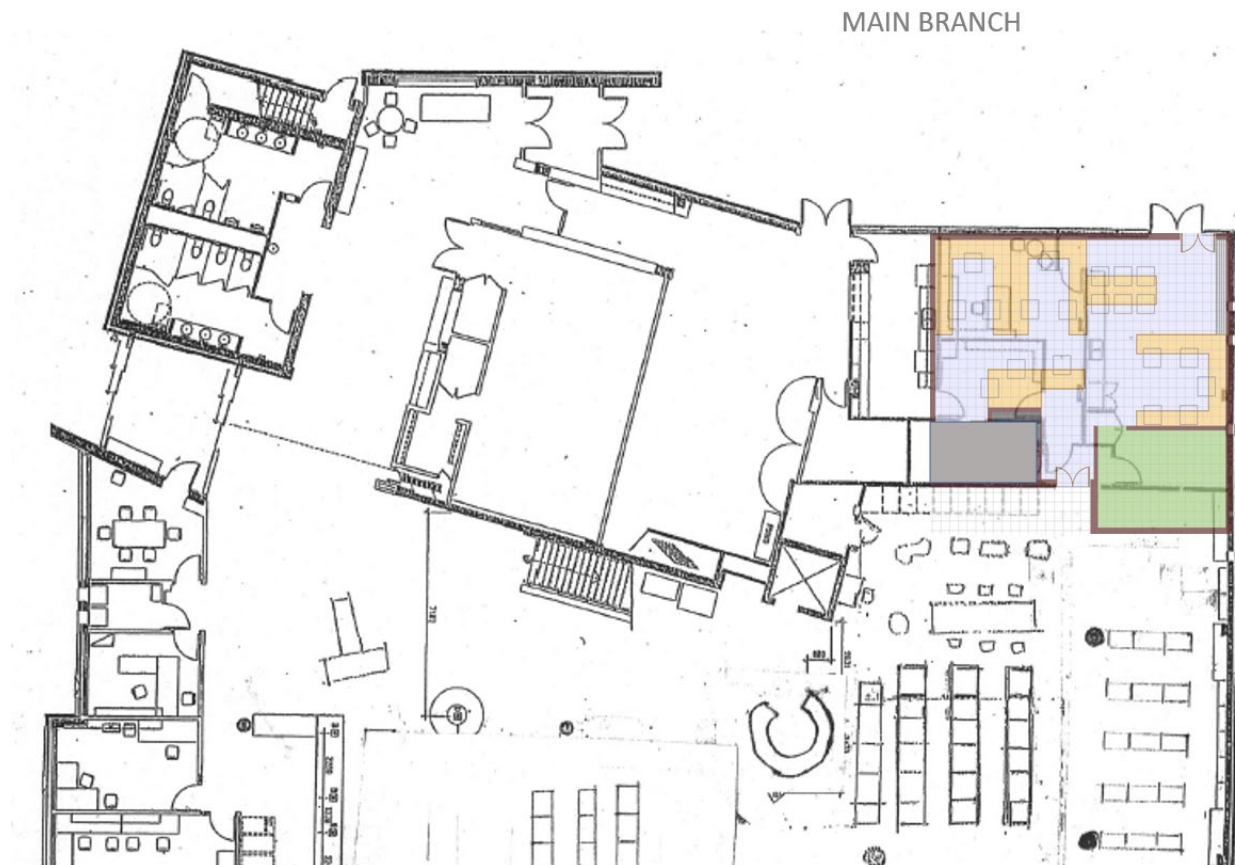
Area Description – Option 1	Gross Floor Area
<b>Main Branch</b>	
Level 1	920
<b>Total Gross Floor Area (square feet)</b>	<b>920</b>
<b>Total Gross Floor Area (square meters)</b>	<b>85</b>

Area Description – Option 2	Gross Floor Area
<b>Mc Lean Branch</b>	
Room #3	1,440
<b>Total Gross Floor Area (square feet)</b>	<b>1,440</b>
<b>Total Gross Floor Area (square meters)</b>	<b>134</b>

Area Description – Option 3	Gross Floor Area
Mc Lean Branch	
Room #1	1,435
<b>Total Gross Floor Area (square feet)</b>	<b>1,435</b>
<b>Total Gross Floor Area (square meters)</b>	<b>133</b>

## 7.2 Gross Floor Areas (graphical representations)

Main Branch





McLean Branch Room #3 & Room #1

MCLEAN BRANCH



**MULTIPLE ESTIMATE SUMMARY**  
**TOWN OF AJAX LIBRARY MAKERSPACE REROFIT**  
ORDER OF MAGNITUDE ESTIMATE (Rev.0)  
JULY 21, 2021



<b>Hard and Soft Construction Costs</b>	<b>GFA (SF)</b>	<b>Unit (Cost/SF)</b>	<b>Estimated Total</b>
1 Main Branch Level 1	920	\$426.09	\$392,000
2 Mc Lean Branch Room #3	1,440	\$293.06	\$422,000
3 Mc Lean Branch Room #1	1,435	\$315.68	\$453,000

**MASTER ESTIMATE SUMMARY**  
**TOWN OF AJAX LIBRARY MAKERSPACE REROFIT - MAIN**  
**BRANCH**

ORDER OF MAGNITUDE ESTIMATE (Rev.0)  
 JULY 21, 2021

<b>Hard Construction Costs</b>		<b>GFA (SF)</b>	<b>Unit (Cost/SF)</b>	<b>Sub Total</b>	<b>Estimated Total</b>	<b>% of Total</b>
1	Building Interiors	920	\$87.10		\$80,130	24.1%
	- Partitions and Doors		\$30.36	\$27,933		
	- Finishes		\$17.72	\$16,304		
	- Fittings and Equipment		\$39.01	\$35,893		
2	Mechanical	920	\$46.41		\$42,698	12.9%
	- Plumbing and Drainage		\$28.26	\$26,000		
	- Fire Protection		\$4.00	\$3,680		
	- Heating, Ventilation, Air Conditioning		\$14.15	\$13,018		
	- Controls		\$0.00	\$0		
3	Electrical	920	\$49.73		\$45,747	13.8%
	- Service and Distribution		\$37.77	\$34,750		
	- Lighting, Devices, and Heating		\$11.95	\$10,997		
	- Systems and Ancillaries		\$0.00	\$0		
4	Ancillary Work	920	\$50.49		\$46,451	14.0%
	- Demolition		\$21.06	\$19,371		
	- Alterations		\$29.43	\$27,080		
5	Contractor's General Requirements	10.0%	920	\$30.98	\$28,500	8.6%
6	Contractor's Fees (OH&P)	5.0%	920	\$13.04	\$12,000	3.6%
7	Design & Pricing Contingency	15.0%	920	\$41.74	\$38,400	11.6%
<b>Sub Total (current dollars)</b>		<b>920</b>	<b>\$319.57</b>		<b>\$294,000</b>	
8	Escalation Contingency	2.8%	920	\$8.91	\$8,200	2.5%
<b>Sub Total (including escalation to Q2 (Apr) 2022)</b>		<b>920</b>	<b>\$328.26</b>		<b>\$302,000</b>	
9	Construction Contingency (Post Contract Changes)	10.0%	920	\$32.83	\$30,200	9.1%
<b>Total Estimated Hard Construction Cost</b>		<b>920</b>	<b>\$360.87</b>		<b>\$332,000</b>	

**MASTER ESTIMATE SUMMARY**  
**TOWN OF AJAX LIBRARY MAKERSPACE REROFIT - MAIN**  
**BRANCH**

ORDER OF MAGNITUDE ESTIMATE (Rev.0)  
 JULY 21, 2021

<b>Estimated Soft Costs</b>	<b>% of Hard Costs</b>	<b>Estimated Total</b>	<b>% of Total</b>
1 Consultant Fees (Architect, Engineers, Speciality Consultants, Etc.)	12%	\$40,000	66.7%
2 Disbursements and Reimbursable Expenses		INC Above	0.0%
3 Project Management Fees	5%	\$16,600	27.7%
4 Independent Inspection and Testing		Excluded	0.0%
5 Third Party Commissioning		Excluded	0.0%
6 Legal Fees		Excluded	0.0%
7 Permits, Development Charges		Included in the Estimate	0.0%
8 Operational Expenses		Excluded	0.0%
9 Financing and Loan Fees		Excluded	0.0%
10 Owner Supplied Furnishings, Fixtures, and Equipment		Excluded	0.0%
- loose furniture			0.0%
- kitchen equipment, smallwares, appliances			0.0%
- laundry and garbage handling equipment			0.0%
- artwork, signature signage, interior landscaping, etc.			0.0%
- IT and Telecomm hardware and systems			0.0%
- AV Systems and cabling			0.0%
11 Land Acquisition Costs		Excluded	0.0%
12 Harmonized Sales Tax		Excluded	0.0%
<b>Soft Costs Sub Total</b>		<b>\$57,000</b>	
13 Soft Cost Contingency	5%	\$2,850	4.8%
<b>Total Estimated Soft Costs</b>		<b>\$60,000</b>	

<b>Estimated Construction Costs (Breakdown by Major Component)</b>	<b>GFA SF</b>	<b>Unit Cost/SF</b>	<b>Estimated Total</b>	<b>% of Total</b>
1 Building	920	\$282.61	\$260,000	66.3%
2 Alterations and Demolition	920	\$78.26	\$72,000	18.4%
3 Soft Costs	920	\$65.22	\$60,000	15.3%
<b>Total Estimated Hard and Soft Construction Costs</b>	<b>920</b>	<b>\$426.09</b>	<b>\$392,000</b>	

**ELEMENTAL SUMMARY**  
**TOWN OF AJAX LIBRARY MAKERSPACE REROFIT - MAIN**  
**BRANCH**

ORDER OF MAGNITUDE ESTIMATE (Rev.0)  
 JULY 21, 2021

Gross Floor Area **920 SF**

Description Element/Sub-Element					Elemental Cost		\$ per SF	\$ per SF Element	%
	Ratio	Quantity	Unit	Unit Rate	Sub Element	Element Total	Sub Element		
<b>B. INTERIORS</b>									
<b>B1 Partitions &amp; Doors</b>						<b>\$27,933</b>		\$30.36	8.4%
B1.1 Partitions	0.54	494	SF	\$31.04	\$15,333		\$16.67		
B1.2 Doors	0.13	120	SF	\$105.00	\$12,600		\$13.70		
<b>B2 Finishes</b>						<b>\$16,304</b>		\$17.72	4.9%
B2.1 Floor Finishes	1.00	920	SF	\$9.86	\$9,072		\$9.86		
B2.2 Ceiling Finishes	1.00	920	SF	\$4.53	\$4,169		\$4.53		
B2.3 Wall Finishes	2.22	2,042	SF	\$1.50	\$3,064		\$3.33		
<b>B3 Fittings &amp; Equipment</b>						<b>\$35,893</b>		\$39.01	10.8%
B3.1 Fittings & Fixtures	1.00	920	SF	\$39.01	\$35,893		\$39.01		
B3.2 Equipment	0.00	0	SF	\$0.00	\$0		\$0.00		
B3.3 Conveying Systems	0.00	0	SF	\$0.00	\$0		\$0.00		
<b>C. SERVICES</b>									
<b>C1 Mechanical</b>						<b>\$42,698</b>		\$46.41	12.8%
C1.1 Plumbing & Drainage	1.00	920	SF	\$28.26	\$26,000		\$28.26		
C1.2 Fire Protection	1.00	920	SF	\$4.00	\$3,680		\$4.00		
C1.3 HVAC	1.00	920	SF	\$14.15	\$13,018		\$14.15		
C1.4 Controls	0.00	0	SF	\$0.00	\$0		\$0.00		
<b>C2 Electrical</b>						<b>\$45,747</b>		\$49.73	13.8%
C2.1 Service & Distribution	1.00	920	SF	\$37.77	\$34,750		\$37.77		
C2.2 Lighting, Devices & Heating	1.00	920	SF	\$11.95	\$10,997		\$11.95		
C2.3 Systems & Ancillaries	0.00	0	SF	\$0.00	\$0		\$0.00		
<b>D. SITE &amp; ANCILLARY WORK</b>									
<b>D2 Ancillary Work</b>						<b>\$46,451</b>		\$50.49	14.0%
D2.1 Demolition	1.00	920	SF	\$21.06	\$19,371		\$21.06		
D2.2 Alterations	1.00	920	SF	\$29.43	\$27,080		\$29.43		
<b>Z. GENERAL REQUIREMENTS &amp; CONTINGENCIES</b>									
<b>Z1 General Requirements &amp; Fees</b>						<b>\$40,500</b>		\$44.02	12.2%
Z1.1 General Requirements	1.00	920	SF	\$30.98	\$28,500		\$30.98		
Z1.2 Fees	1.00	920	SF	\$13.04	\$12,000		\$13.04		
<b>Z2 Allowances</b>						<b>\$76,800</b>		\$83.48	23.1%
Z2.1 Design & Pricing Contingency	1.00	920	SF	\$41.74	\$38,400		\$41.74		
Z2.2 Escalation Contingency	1.00	920	SF	\$8.91	\$8,200		\$8.91		
Z2.3 Construction Contingency	1.00	920	SF	\$32.83	\$30,200		\$32.83		
<b>TOTAL ESTIMATED CONSTRUCTION COST (nearest ,000)</b>						<b>\$332,000</b>		\$361.22	100.0%

**MASTER ESTIMATE SUMMARY**  
**TOWN OF AJAX LIBRARY MAKERSPACE REROFIT -**  
**MCLEAN BRANCH ROOM #3**

ORDER OF MAGNITUDE ESTIMATE (Rev.0)  
 JULY 21, 2021

<b>Hard Construction Costs</b>		<b>GFA (SF)</b>	<b>Unit (Cost/SF)</b>	<b>Sub Total</b>	<b>Estimated Total</b>	<b>% of Total</b>
1	Building Interiors	1,440	\$70.43		\$101,425	28.3%
	- Partitions and Doors		\$16.57	\$23,858		
	- Finishes		\$15.04	\$21,652		
	- Fittings and Equipment		\$38.83	\$55,915		
2	Mechanical	1,440	\$12.87		\$18,530	5.2%
	- Plumbing and Drainage		\$0.00	\$0		
	- Fire Protection		\$4.00	\$5,760		
	- Heating, Ventilation, Air Conditioning		\$8.87	\$12,770		
	- Controls		\$0.00	\$0		
3	Electrical	1,440	\$49.30		\$70,995	19.8%
	- Service and Distribution		\$37.47	\$53,950		
	- Lighting, Devices, and Heating		\$11.84	\$17,045		
	- Systems and Ancillaries		\$0.00	\$0		
4	Ancillary Work	1,440	\$28.36		\$40,840	11.4%
	- Demolition		\$4.74	\$6,820		
	- Alterations		\$23.63	\$34,020		
5	Contractor's General Requirements	10.0% 1,440	\$20.97		\$30,200	8.4%
6	Contractor's Fees (OH&P)	5.0% 1,440	\$9.03		\$13,000	3.6%
7	Design & Pricing Contingency	15.0% 1,440	\$28.61		\$41,200	11.5%
<b>Sub Total (current dollars)</b>		<b>1,440</b>	<b>\$219.58</b>		<b>\$316,200</b>	
8	Escalation Contingency	2.8% 1,440	\$6.18		\$8,900	2.5%
<b>Sub Total (including escalation to Q2 (Apr) 2022)</b>		<b>1,440</b>	<b>\$225.69</b>		<b>\$325,000</b>	
9	Construction Contingency (Post Contract Changes)	10.0% 1,440	\$22.57		\$32,500	9.1%
<b>Total Estimated Hard Construction Cost</b>		<b>1,440</b>	<b>\$248.61</b>		<b>\$358,000</b>	



**MASTER ESTIMATE SUMMARY**  
**TOWN OF AJAX LIBRARY MAKERSPACE REROFIT -**  
**MCLEAN BRANCH ROOM #3**

ORDER OF MAGNITUDE ESTIMATE (Rev.0)  
 JULY 21, 2021

Estimated Soft Costs	% of Hard Costs	Estimated Total	% of Total
1 Consultant Fees (Architect, Engineers, Speciality Consultants, Etc.)	12%	\$43,000	67.2%
2 Disbursements and Reimbursable Expenses		INC Above	0.0%
3 Project Management Fees	5%	\$17,900	28.0%
4 Independent Inspection and Testing		Excluded	0.0%
5 Third Party Commissioning		Excluded	0.0%
6 Legal Fees		Excluded	0.0%
7 Permits, Development Charges		Included in the Estimate	0.0%
8 Operational Expenses		Excluded	0.0%
9 Financing and Loan Fees		Excluded	0.0%
10 Owner Supplied Furnishings, Fixtures, and Equipment		Excluded	0.0%
- loose furniture			0.0%
- kitchen equipment, smallwares, appliances			0.0%
- laundry and garbage handling equipment			0.0%
- artwork, signature signage, interior landscaping, etc.			0.0%
- IT and Telecomm hardware and systems			0.0%
- AV Systems and cabling			0.0%
11 Land Acquisition Costs		Excluded	0.0%
12 Harmonized Sales Tax		Excluded	0.0%
<b>Soft Costs Sub Total</b>		<b>\$61,000</b>	
13 Soft Cost Contingency	5%	\$3,050	4.8%
<b>Total Estimated Soft Costs</b>		<b>\$64,000</b>	

Estimated Construction Costs (Breakdown by Major Component)	GFA SF	Unit Cost/SF	Estimated Total	% of Total
1 Building	1,440	\$204.86	\$295,000	69.9%
2 Alterations and Demolition	1,440	\$43.75	\$63,000	14.9%
3 Soft Costs	1,440	\$44.44	\$64,000	15.2%
<b>Total Estimated Hard and Soft Construction Costs</b>	<b>1,440</b>	<b>\$293.06</b>	<b>\$422,000</b>	

**ELEMENTAL SUMMARY**  
**TOWN OF AJAX LIBRARY MAKERSPACE REROFIT -**  
**MCLEAN BRANCH ROOM #3**

ORDER OF MAGNITUDE ESTIMATE (Rev.0)  
 JULY 21, 2021

Gross Floor Area **1,440 SF**

Description Element/Sub-Element	Ratio	Quantity	Unit	Unit Rate	Elemental Cost		\$ per SF Sub Element	\$ per SF Element	%
					Sub Element	Element Total			
<b>B. INTERIORS</b>									
<b>B1 Partitions &amp; Doors</b>						<b>\$23,858</b>		\$16.57	6.7%
B1.1 Partitions	0.46	663	SF	\$23.54	\$15,608		\$10.84		
B1.2 Doors	0.07	96	SF	\$85.94	\$8,250		\$5.73		
<b>B2 Finishes</b>						<b>\$21,652</b>		\$15.04	6.1%
B2.1 Floor Finishes	1.00	1,440	SF	\$7.29	\$10,504		\$7.29		
B2.2 Ceiling Finishes	1.00	1,440	SF	\$4.41	\$6,353		\$4.41		
B2.3 Wall Finishes	2.22	3,197	SF	\$1.50	\$4,795		\$3.33		
<b>B3 Fittings &amp; Equipment</b>						<b>\$55,915</b>		\$38.83	15.6%
B3.1 Fittings & Fixtures	1.00	1,440	SF	\$38.83	\$55,915		\$38.83		
B3.2 Equipment	0.00	0	SF	\$0.00	\$0		\$0.00		
B3.3 Conveying Systems	0.00	0	SF	\$0.00	\$0		\$0.00		
<b>C. SERVICES</b>									
<b>C1 Mechanical</b>						<b>\$18,530</b>		\$12.87	5.2%
C1.1 Plumbing & Drainage	0.00	0	SF	\$0.00	\$0		\$0.00		
C1.2 Fire Protection	1.00	1,440	SF	\$4.00	\$5,760		\$4.00		
C1.3 HVAC	1.00	1,440	SF	\$8.87	\$12,770		\$8.87		
C1.4 Controls	0.00	0	SF	\$0.00	\$0		\$0.00		
<b>C2 Electrical</b>						<b>\$70,995</b>		\$49.30	19.9%
C2.1 Service & Distribution	1.00	1,440	SF	\$37.47	\$53,950		\$37.47		
C2.2 Lighting, Devices & Heating	1.00	1,440	SF	\$11.84	\$17,045		\$11.84		
C2.3 Systems & Ancillaries	0.00	0	SF	\$0.00	\$0		\$0.00		
<b>D. SITE &amp; ANCILLARY WORK</b>									
<b>D2 Ancillary Work</b>						<b>\$40,840</b>		\$28.36	11.4%
D2.1 Demolition	1.00	1,440	SF	\$4.74	\$6,820		\$4.74		
D2.2 Alterations	1.00	1,440	SF	\$23.63	\$34,020		\$23.63		
<b>Z. GENERAL REQUIREMENTS &amp; CONTINGENCIES</b>									
<b>Z1 General Requirements &amp; Fees</b>						<b>\$43,200</b>		\$30.00	12.1%
Z1.1 General Requirements	1.00	1,440	SF	\$20.97	\$30,200		\$20.97		
Z1.2 Fees	1.00	1,440	SF	\$9.03	\$13,000		\$9.03		
<b>Z2 Allowances</b>						<b>\$82,600</b>		\$57.36	23.1%
Z2.1 Design & Pricing Contingency	1.00	1,440	SF	\$28.61	\$41,200		\$28.61		
Z2.2 Escalation Contingency	1.00	1,440	SF	\$6.18	\$8,900		\$6.18		
Z2.3 Construction Contingency	1.00	1,440	SF	\$22.57	\$32,500		\$22.57		
<b>TOTAL ESTIMATED CONSTRUCTION COST (nearest ,000)</b>						<b>\$358,000</b>		\$248.33	100.0%

**MASTER ESTIMATE SUMMARY**  
**TOWN OF AJAX LIBRARY MAKERSPACE REROFIT -**  
**MCLEAN BRANCH ROOM #1**

ORDER OF MAGNITUDE ESTIMATE (Rev.0)  
 JULY 21, 2021

<b>Hard Construction Costs</b>		<b>GFA (SF)</b>	<b>Unit (Cost/SF)</b>	<b>Sub Total</b>	<b>Estimated Total</b>	<b>% of Total</b>
1	Building Interiors	1,435	\$82.28		\$118,069	30.7%
	- Partitions and Doors		\$26.52	\$38,062		
	- Finishes		\$17.07	\$24,497		
	- Fittings and Equipment		\$38.68	\$55,510		
2	Mechanical	1,435	\$13.43		\$19,270	5.0%
	- Plumbing and Drainage		\$0.70	\$1,000		
	- Fire Protection		\$4.00	\$5,740		
	- Heating, Ventilation, Air Conditioning		\$8.73	\$12,530		
	- Controls		\$0.00	\$0		
3	Electrical	1,435	\$49.10		\$70,455	18.3%
	- Service and Distribution		\$37.32	\$53,550		
	- Lighting, Devices, and Heating		\$11.78	\$16,905		
	- Systems and Ancillaries		\$0.00	\$0		
4	Ancillary Work	1,435	\$29.40		\$42,194	11.0%
	- Demolition		\$7.47	\$10,714		
	- Alterations		\$21.94	\$31,480		
5	Contractor's General Requirements	10.0%	1,435	\$22.30	\$32,000	8.3%
6	Contractor's Fees (OH&P)	5.0%	1,435	\$9.76	\$14,000	3.6%
7	Design & Pricing Contingency	15.0%	1,435	\$30.94	\$44,400	11.5%
<b>Sub Total (current dollars)</b>		<b>1,435</b>	<b>\$237.21</b>		<b>\$340,400</b>	
8	Escalation Contingency	2.8%	1,435	\$6.62	\$9,500	2.5%
<b>Sub Total (including escalation to Q2 (Apr) 2022)</b>		<b>1,435</b>	<b>\$243.90</b>		<b>\$350,000</b>	
9	Construction Contingency (Post Contract Changes)	10.0%	1,435	\$24.39	\$35,000	9.1%
<b>Total Estimated Hard Construction Cost</b>		<b>1,435</b>	<b>\$268.29</b>		<b>\$385,000</b>	

**MASTER ESTIMATE SUMMARY**  
**TOWN OF AJAX LIBRARY MAKERSPACE REROFIT -**  
**MCLEAN BRANCH ROOM #1**

ORDER OF MAGNITUDE ESTIMATE (Rev.0)  
 JULY 21, 2021

<b>Estimated Soft Costs</b>	<b>% of Hard Costs</b>	<b>Estimated Total</b>	<b>% of Total</b>
1 Consultant Fees (Architect, Engineers, Speciality Consultants, Etc.)	12%	\$46,000	67.6%
2 Disbursements and Reimbursable Expenses		INC Above	0.0%
3 Project Management Fees	5%	\$19,250	28.3%
4 Independent Inspection and Testing		Excluded	0.0%
5 Third Party Commissioning		Excluded	0.0%
6 Legal Fees		Excluded	0.0%
7 Permits, Development Charges		Included in the Estimate	0.0%
8 Operational Expenses		Excluded	0.0%
9 Financing and Loan Fees		Excluded	0.0%
10 Owner Supplied Furnishings, Fixtures, and Equipment		Excluded	0.0%
- loose furniture			0.0%
- kitchen equipment, smallwares, appliances			0.0%
- laundry and garbage handling equipment			0.0%
- artwork, signature signage, interior landscaping, etc.			0.0%
- IT and Telecomm hardware and systems			0.0%
- AV Systems and cabling			0.0%
11 Land Acquisition Costs		Excluded	0.0%
12 Harmonized Sales Tax		Excluded	0.0%
<b>Soft Costs Sub Total</b>		<b>\$65,000</b>	
13 Soft Cost Contingency	5%	\$3,250	4.8%
<b>Total Estimated Soft Costs</b>		<b>\$68,000</b>	

<b>Estimated Construction Costs (Breakdown by Major Component)</b>	<b>GFA SF</b>	<b>Unit Cost/SF</b>	<b>Estimated Total</b>	<b>% of Total</b>
1 Building	1,435	\$223.00	\$320,000	70.6%
2 Alterations and Demolition	1,435	\$45.30	\$65,000	14.3%
3 Soft Costs	1,435	\$47.39	\$68,000	15.0%
<b>Total Estimated Hard and Soft Construction Costs</b>	<b>1,435</b>	<b>\$315.68</b>	<b>\$453,000</b>	

**ELEMENTAL SUMMARY**  
**TOWN OF AJAX LIBRARY MAKERSPACE REROFIT -**  
**MCLEAN BRANCH ROOM #1**

ORDER OF MAGNITUDE ESTIMATE (Rev.0)  
 JULY 21, 2021

Gross Floor Area **1,435 SF**

Description Element/Sub-Element	Ratio	Quantity	Unit	Unit Rate	Elemental Cost		\$ per SF Sub Element	\$ per SF Element	%
					Sub Element	Element Total			
<b>B. INTERIORS</b>									
<b>B1 Partitions &amp; Doors</b>						<b>\$38,062</b>		\$26.52	9.9%
B1.1 Partitions	0.67	967	SF	\$32.74	\$31,662		\$22.06		
B1.2 Doors	0.05	72	SF	\$88.89	\$6,400		\$4.46		
<b>B2 Finishes</b>						<b>\$24,497</b>		\$17.07	6.4%
B2.1 Floor Finishes	1.00	1,435	SF	\$9.39	\$13,471		\$9.39		
B2.2 Ceiling Finishes	1.00	1,435	SF	\$4.35	\$6,248		\$4.35		
B2.3 Wall Finishes	2.22	3,186	SF	\$1.50	\$4,779		\$3.33		
<b>B3 Fittings &amp; Equipment</b>						<b>\$55,510</b>		\$38.68	14.4%
B3.1 Fittings & Fixtures	1.00	1,435	SF	\$38.68	\$55,510		\$38.68		
B3.2 Equipment	0.00	0	SF	\$0.00	\$0		\$0.00		
B3.3 Conveying Systems	0.00	0	SF	\$0.00	\$0		\$0.00		
<b>C. SERVICES</b>									
<b>C1 Mechanical</b>						<b>\$19,270</b>		\$13.43	5.0%
C1.1 Plumbing & Drainage	1.00	1,435	SF	\$0.70	\$1,000		\$0.70		
C1.2 Fire Protection	1.00	1,435	SF	\$4.00	\$5,740		\$4.00		
C1.3 HVAC	1.00	1,435	SF	\$8.73	\$12,530		\$8.73		
C1.4 Controls	0.00	0	SF	\$0.00	\$0		\$0.00		
<b>C2 Electrical</b>						<b>\$70,455</b>		\$49.10	18.3%
C2.1 Service & Distribution	1.00	1,435	SF	\$37.32	\$53,550		\$37.32		
C2.2 Lighting, Devices & Heating	1.00	1,435	SF	\$11.78	\$16,905		\$11.78		
C2.3 Systems & Ancillaries	0.00	0	SF	\$0.00	\$0		\$0.00		
<b>D. SITE &amp; ANCILLARY WORK</b>									
<b>D2 Ancillary Work</b>						<b>\$42,194</b>		\$29.40	11.0%
D2.1 Demolition	1.00	1,435	SF	\$7.47	\$10,714		\$7.47		
D2.2 Alterations	1.00	1,435	SF	\$21.94	\$31,480		\$21.94		
<b>Z. GENERAL REQUIREMENTS &amp; CONTINGENCIES</b>									
<b>Z1 General Requirements &amp; Fees</b>						<b>\$46,000</b>		\$32.06	12.0%
Z1.1 General Requirements	1.00	1,435	SF	\$22.30	\$32,000		\$22.30		
Z1.2 Fees	1.00	1,435	SF	\$9.76	\$14,000		\$9.76		
<b>Z2 Allowances</b>						<b>\$88,900</b>		\$61.95	23.1%
Z2.1 Design & Pricing Contingency	1.00	1,435	SF	\$30.94	\$44,400		\$30.94		
Z2.2 Escalation Contingency	1.00	1,435	SF	\$6.62	\$9,500		\$6.62		
Z2.3 Construction Contingency	1.00	1,435	SF	\$24.39	\$35,000		\$24.39		
<b>TOTAL ESTIMATED CONSTRUCTION COST (nearest ,000)</b>						<b>\$385,000</b>		\$268.21	100.0%