Spaces of Production

From the Industrial to the Virtual City

by

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A thesis

presented to the University of Waterloo

in fulfillment of the

thesis requirement for the degree of

Master of Architecture

Waterloo, Ontario, Canada, 2017

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

In the industrial city, capitalist ownership over the means of production: land, buildings, tools, technology and knowledge, enabled the centralization, control and exploitation of the working class. Monetary exchange, property relations, and the dominance of production for the sole purpose of capital accumulation developed alienating social relations in the life of the city. In the post-industrial city, the liberation of information through digital networks has democratized the intellectual means of production creating dramatic shifts in labour, exchange, and social relations. These shifts have the potential to create the conditions for an even greater gap of inequality, a return to an economy dominated by inherited wealth[1], and where capitalism seeks to capture economic value in all aspects of work, life and the city.[2] The thesis seeks to explore how design and architectural practice can be used as a means to collectively organize and mobilize the emerging precariat class to reappropriate fixed capital

1 Thomas Piketty, *Capital in the Twenty-First Century*, trans. Arthur Goldhammer (Cambridge, MA: Harvard University Press, 2014).

2 Maurizio Lazzarato. "Immaterial Labour." In *Radical Thought in Italy: A Potential Politics*, edited by Paolo Virno, by Michael Hardt. (Minneapolis, MN: University of Minnesota Press, 1996), 133.; Jeremy Rifkin, *The Age of Access: The New Culture of Hypercapitalism, Where All of Life Is a Paid-for Experience,* New York: J.P. Tarcher/Putnam, 2000, 100.

and transform labour power into a cooperative space of production.

The thesis focuses on the city of Kitchener, drawing from its history as a city built by artisans and the recent re-emergence of a new creative working class that has propelled the maker movement. Using the city as a place for prototyping community and space, new spaces of production are emerging through grassroots communities to test the material, social and financial platforms of a post-capitalist system. Interviews with makers, artists, and creative entrepreneurs will explore the emerging spatial models in the productive economy. The thesis will use strategies of the maker-movement, the process of learning through doing, and lean thinking to prototype spatial programming, the organization of the collective and the feasibility of operating a productive workspace. Through the documentation of the process, the thesis seeks to develop a process guide for the precariat worker to collectively organize a community lab workspace, own the means of production, and develop a networked production infrastructure in the city.

Acknowledgements

I would like to thank my supervisor, Rick Haldenby, for his continuous guidance and invaluable feedback throughout this process. Your knowledge of the Kitchener-Waterloo Region and introductions to many individuals in the community were critical in forming the overall development of the thesis. Adrian Blackwell, thank you for pushing me to examine my research more critically and for introducing me to many of the readings that helped guide the theoretical core of the thesis. David Correa, thank you for your enthusiasm to be part of the committee and bringing your fresh perspective as a maker to the research. Thank you to everyone at the City of Kitchener, specifically Emily and Rod, for their expertise and allowing me to participate in the city's community planning meetings. Also, a big thank you to the artists, makers, and creatives that took the time to share their stories and experiences. It was humbling to be welcomed into your community. Thank you to my friends and colleagues for inspiring me with your work and helping me push towards the finish line. To my parents, thank you for supporting me and simply allowing me to enjoy the process of obtaining my degree. I'm thankful to have shared this experience with everyone I have met and worked with along the way.

Dedication

To makers and the creative class.

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INTRODUCTION

The development of cities follows the changing relations of production and exchange. Over time, the dominating processes of exchange and production were spatialized and embodied in architectural and urban form.[1]

Economically defined, the city is a settlement of inhabitants which live primarily off trade and commerce rather than agriculture.[2] However, the city can be seen as a materialization of the complex processes that can be broken down as an evolution, though not necessarily perfectly linear, of the changing political and economic systems of their time. Using Henri Lefebvre's Rural-Urban Axis as a framework of development, the emergence of city types can be traced from complete nature to total urbanization. Along this axis, the development of the urban began as the political city organized through the control of politics and power and embodied in the agora, a central place of assembly at the heart of the city. Political concentrations defined urban communities as Max Weber described,

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1 Henri Lefebvre, *The Urban Revolution*. Minneapolis: University of Minnesota Press, 2003.

2 Max Weber, "The Nature of the City," in *Classic Essays on the Culture of Cities*, ed. Richard Sennett (Englewood Cliffs, NJ: Prentice Hall, 1969), 23.

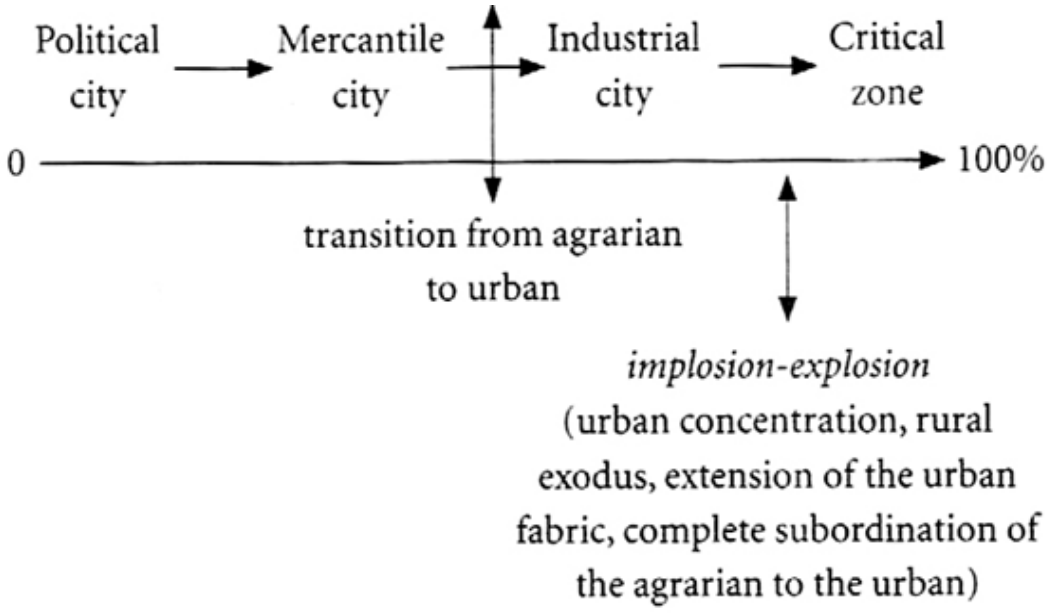

Fig. 0.1 Rural-Urban Axis by Henri Lefebvre

> *"…rights such as those which define the urban community were normally privileges of the estates. The peculiar political properties of the urban community appeared only with the presence of a special stratum, a distinct new estate."*[3]

By securing a system of hereditary rule, nobility could hold power over land and territories by regulating the social, political, judicial and economic spheres. To establish economic stability within the city, the existence of a place of settlement was needed for a regular rather than an occasional exchange of goods.[4] Conversely, the necessity to procure materials through exchange brought artisans and workers to the city. Beginning as informal markers of places of exchange or trade, these processes expanded until it began integrating into the everyday life of the city.

At this point the mercantile city overlapped with the political city by embodying commercial exchange as an urban function in architectural and urban form, the marketplace.[5] The urban market facilitated the commercial relations between workers, artisans and merchant capitalists through commodity exchange. Similarly, Weber describes

3 Max Weber, *The Nature of the City*, 38.

4 Ibid, 24.

5 Henri Lefebvre. *The Urban Revolution*, 13.

the emergence of the mercantile city:

> *"The local market forms the economic center of the colony in which, due to the specialization in economic products, both the nonurban population and urbanites satisfy their wants for articles of trade and commerce… the city is a 'marketplace settlement."*[6]

The marketplace allowed cities to concentrate capital thus increasing influence and power by controlling the means of exchange over neighbouring territories. The aggregation of exchange and trade through the increase in population and purchasing power gave rise to the consumer and producer city as described by Weber, "the location there of factories, manufactures, or home-work industries supplying outside territories."[7] or to Lefebvre as the "Industrial City". The consolidation of merchant and industrial capital, the development of mass production and the creation of individual markets by big industry brought the rise of production as the governing function in the flows of commercial capital in the industrial city. Though industry initially situated itself outside of the city, near sources of energy, or raw materials, it eventually made its way to the

6 Max Weber, *The Nature of the City*, 24-25.

7 Henri Lefebvre. *The Urban Revolution*, 27.

city producing intense urban concentrations. David Harvey describes the investment in the built environment as a key element in the secondary and tertiary circuits of capital accumulation.[8] Embodying this process in architectural form, the factory emerged from the industrial city becoming the centralizing place of production,

> *" Within the enterprise, labor is divided up and organized so it can be completed without the products of that labor or the labor itself passing through the marketplace."*[9]

Industrial capitalists controlled the means of production motivated by the sole purpose of accumulating wealth, "capital personified and endowed with consciousness and a will."[10] This resulted in the centralization of capital and the alienating social relations with the working class. Automation and mass assembly reduced workers to unskilled labour in order to increase efficiency for commercial production.

Lefebvre describes this point of the industrial city as the

8 David Harvey, *The Urban Process under Capitalism: A Framework for Analysis*. Oxford: Blackwell, 1978, 107.

9 Henri Lefebvre, The Urban Revolution, 34.

10 Karl Marx, *Capital,* Volume I. Translated by Ben Fowkes. London: Penguin Books, 1990 [1867], 139

prelude to a critical zone leading up to total urbanization, the occurrence of implosion-explosion, a period of exponential concentrated urban growth while also projecting the urban across vast territories. Consequently, the urban is not only produced through the forces of production but also becomes a productive force in its own right. In the explosion of the urban, new production, exchange and social relations emerge.

Building from Lefebvre's rural-urban axis, the thesis supposes the emergence of the virtual city based on the movement towards a service, knowledge and network based economy. In this transition from the industrial to the virtual, the efficiency of industrial division will be extended to the social division of labour.[11] The resulting shifts in labour, exchange and social relations have the potential to create the conditions for an even greater totalitarian era where capitalism seeks to capture production value in all aspects of work, life and the city.

Spaces of Production from the Industrial to the Virtual City investigates the re-emergence of production and industry in the virtual city through the maker movement and the

11 Henri Lefebvre, *The Urban Revolution*, 34.

desire for reconnecting with the physical world through material exploration. The thesis proposes the possibility of reorganizing the industrial factory, used as a means of capitalist control, into a new space of production as a means for the autonomous working class to collectively organize and reclaim production for their own ends.

The thesis is organized into four sections to provide the theoretical background, site context, interviews and a design guide to explore the organization of a community driven development process in prototyping industrial urban space.

The first chapter examines the role of production in the urban environment, the movement from the political city to the industrial city following Lefebvre's rural-urban axis, and the resulting shifts in the predominant spaces of production. The second chapter provides an overview of the history of the city of Kitchener, the role industry, craft, and making has had in the development of the city and the transformative potentials in reusing the city's industrial factories and warehouses for creative production. The third chapter documents a series of interviews with makers, artists, creative entrepreneurs and organizations to examine

the creative autonomous working class in the Kitchener-Waterloo region and Toronto creative communities. The fourth chapter documents a process in the form of a do-it-yourself guide for the creative community to develop a space of production of one's own.

CHAPTER 1:

SPACES OF PRODUCTION

The Industrial City

Early spaces of production involved individuals producing goods domestically for their own use. During this time, wealth was accumulated from the land with agricultural activities constrained by seasonal intervals. In temperate climates, this resulted in varying cycles of rural employment with labour shortages during the harvest season and labour surpluses in the off season. To combat this, the adoption of industry by a growing number of farmhands meant that labour previously unemployed or underemployed during a part of the year had potential work on a more continuous basis.[1] This gave rise to the cottage industry which saw producers sell their products to local merchants or markets. With the increased production of goods in the home, this led to the creation of workshops, separate rooms or buildings devoted to manufacturing.[2] The growth of traditionally organized but principally rural industry was considered by Franklin Mendel as proto-industrialization, a phase which set the conditions for the industrial city.[3]

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1 Franklin F. Mendels. "Proto-Industrialization: The First Phase of the Industrialization Process." *The Journal of Economic History* 32, no. 1 (1972): 242. http://www.jstor.org.proxy.lib.uwaterloo.ca/stable/2117187.

2 David S. Landes, The Unbound Prometheus: Technological Change and Industrial Development in Western Europe from 1750 to the Present. Cambridge, UK: Cambridge University Press, 2003, 65.

3 Mendels, *Proto-Industrialization*, 241.

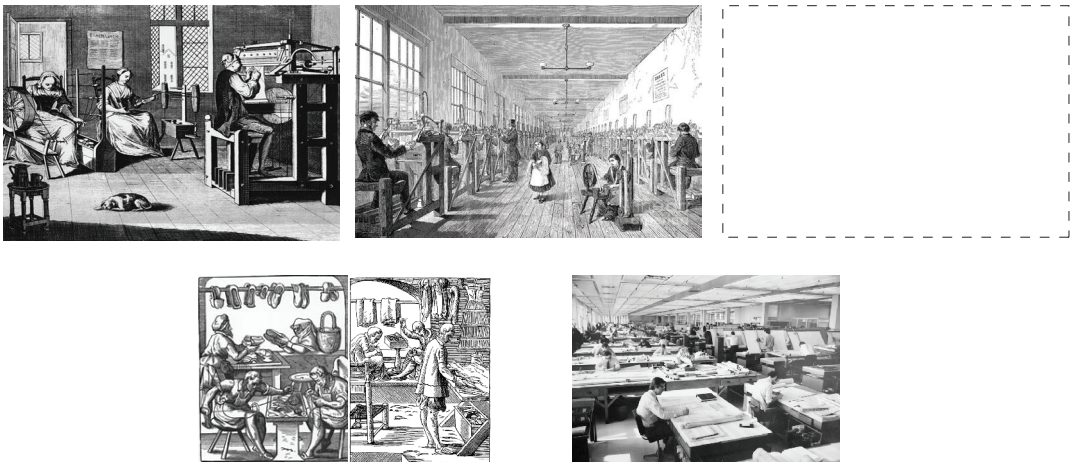

Fig. 1.1 Shifting Places of Production in the City

Proto-industrialization showed early signs of the division of labour in which surplus value could be derived through the individual exchange of resources to produce a final product.[4] Merchants provided materials and subcontracted work to multiple craftsmen, employing the means of production and labour power, to produce a finished good that was sold on the market for money greater than its equivalent inputs. Through this development,

> *"proto-industrialization had created an accumulation of capital in the hands of merchant entrepreneurs, making possible the adoption of machine industry with its (relatively) higher capital costs. It further helped to form an entrepreneurial class and entrepreneurial skills which played a large role in the beginning of modem industrialization"*[5]

Merchants acted as intermediaries between the separated processes in production and in facilitating the exchange, the merchant was able to capture the flows of production,

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4 Herman Freudenberger and Fritz Redlich, "The Industrial Development Of Europe: Reality, Symbols, Images," Kyklos 17, no. 3 (August 1964): 378, doi:10.1111/j.1467-6435.1964.tb01748.x.

5 Mendels, *Proto-Industrialization*, 244.

distribution and consumption to derive surplus value.[6] With the introduction of technology and machinery during the Industrial Revolution, factories arose when capital and space requirements became too great for cottage industry and workshops to compete against.[7] Through the processes of industrialization, production became embedded in the city, embodied in factories, warehouses, and industrial urban form.[8] However, this did not mark the disappearance of the workshop but simply a shift in the predominant place of production. Handicrafts still played a role in new industry as the trade shifted to products and specialties which had not yet been mechanized.[9]

The emergence of the factory type in the industrial period characterizes the rise of the industrial capitalist,

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6 Peter Kriedte, Hans Medick, and Jürgen Schlumbohm, Industrialization before industrialization: rural industry in the genesis of capitalism (Cambridge: Cambridge University Press, 1981).; Rab Houston and K. D. M. Snell. "Proto-Industrialization? Cottage Industry, Social Change, and Industrial Revolution." *The Historical Journal* 27, no. 2 (1984): 474. http://www.jstor.org/stable/2639188.

7 Landes, *The Unbound Prometheus*, 260.

8 Lefebvre, *The Urban Revolution*,13.; Weber, *The Nature of the City*, 27; Mendels, *Proto-Industrialization,* 256.

9 Kriedte, Medick, and Schlumbohm, *Industrialization before industrialization*, 21.; Mendels, *Proto-Industrialization*, 246.

the centralization and control over the organization of labour and the means of production.[10] The advent of standardization and technology, particularly assembly lines, helped simplify the manufacturing process to increase efficiency and production by employing unskilled labourers. In the process, the labourer simply becomes an extension of the machine, a tool of capital.[11] Meanwhile, industrial capitalists further accelerated the circulation of capital by hiring labourers to produce material goods in the factory, only to sell the manufactured products back to the workers further exploit the labour power they employ.

The factory becomes the capitalist machine of accumulation employed by the industrial capitalist to concentrate fixed capital and exploit the working class. [12] However, even with the exploitive process made explicit, the industrial capitalist maintains control through the centralization and ownership over the means of production: land, tools, technology, buildings and knowledge. As long as the working class are unable to socially organize their labour

10 Weber, *The Nature of the City*, 27.

11 Marx, *Capital*, 497.

12 John Richard Hicks, Capital and Growth (London: Oxford University Press, 1965), 31-34.

power and purchase the means of production, the industrial capitalist can maintain control in extracting surplus value from the working class. If the factory was the means for the industrial capitalist to organize, control and extract value from the working class, new spaces of production are required to provide the labour force a means to independently organize and produce for their own use. The disappearance of the factory and the new relations of production in the post-industrial city shows signs of a shift to the development of a new type of city along the rural-urban axis. The introduction of information technology, digital networks and dematerialization of production and exchange suggest the emergence of the virtual in the city.

Changes in the productive forces and relations of production are changing the mode of production that characterized the industrial city. As the mode of production shifts, so too does the predominant place of production. However, to understand the emergent space of production, we must examine the shifting tendencies in the mode of production in the post-industrial city. The emergence of digital networks and the dematerialization of labour, markets and capital seems to suggest the emergence of the virtual city.

By virtual that is not to suggest the disappearance of the city but in fact quite the contrary. As the processes of production, distribution and exchange dematerializes, the city continues to intensify through accelerated urban growth. Similar to previous shifts in the city, the industrial city continues to defend itself from being taken over through the sociopolitical organization of industrial corporate interest groups to maintain control. However, in the expansion of industry, capitalists produced the conditions for the virtual city through automation, virtual exchange and virtual capital. The rise of the digital network created shifts in labour, exchange and work relations that provide an opportunity for the working class to overturn capitalist ownership over the means of production.[13]

13 Karl Marx, *Grundrisse: Foundations of the Critique of Political Economy*, trans. Martin Nicolaus (New York: Vintage Books, 1973), 632.; Antonio Negri, *The Politics of Subversion: A Manifesto for the Twenty-First Century*, trans. James Newell (Cambridge: Polity Press, 2010), 80.; Robin Mackay and Armen Avanessian. *#Accelerate: The Accelerationist Reader*. Falmouth, United Kingdom: Urbanomic Media, 2014, 28.

Rural-Urban Shifts: The Virtual City

The virtual city marks the transformation of the underlying structures of the industrial era into a new period characterized by the dematerialization of labour and production and the implosion of the social, productive and political forces into a single process dominated by capitalist enterprise. Sociologist, Maurizio Lazzarato, describes in his essay '*Immaterial Labour*", how the shift from material to immaterial labour, labour that produces the informational and cultural content of a commodity, is radically changing the organization of production and the nature of social relations in society.[14] He warns that the transformation of work "threatens to be even more totalitarian… because capitalism seeks to involve even the worker's personality and subjectivity within the production of value."[15] By capitalizing on the worker's subjectivity, labour, lifestyle and ideologies are commoditized. Work and everyday life becomes indistinguishable. Individuals become products and producers of mass intellectuality under capitalist control.

In the industrial city, capitalists exploited labour through the physical ownership of the means of production. However,

14 Maurizio Lazzarato. "Immaterial Labour.", 132.

15 Ibid, 135.

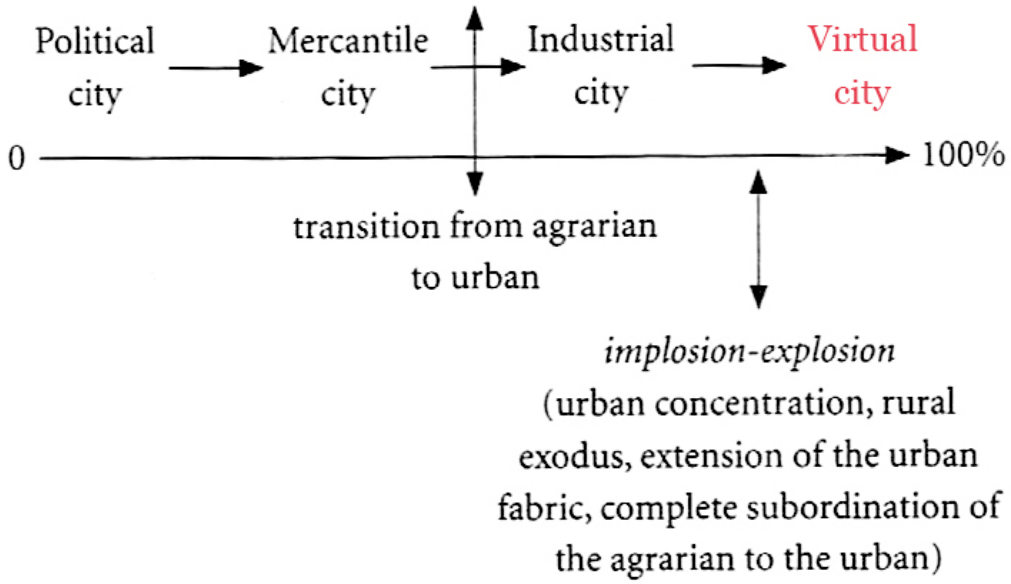

Fig. 1.2 The Virtual City in the Rural-Urban Axis

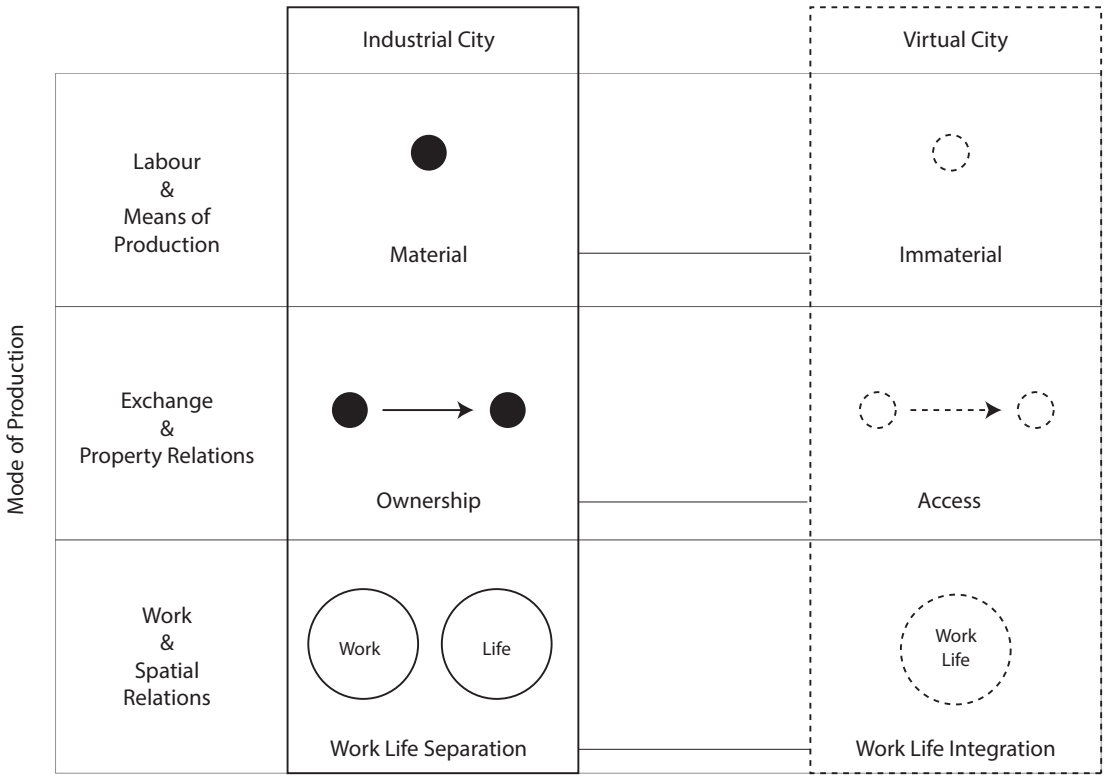

Fig. 1.3 Shifting Mode of Production from the Industrial to Virtual

the virtual city is shifting from the industrial paradigm of property ownership and fixed capital to an age where capitalists seek temporary access to the physical means of production and ownership of intellectual property. Physical assets are considered a liability and property exchange gives way to supplier-user networks. The twenty first century business doesn't permanently employ any workers, own factories or build physical distribution networks. Instead, new capitalist enterprise exploits 'autonomous labour' by deferring risk to the individual worker while capitalizing on the flows of the production cycle. Lazzarato describes, "Only at the conjunction of different flows (of production, circulation, consumption and desire) is there production of surplus value, and only there does this production become visible".[16] In the virtual city, the processes of production, circulation, consumption and desire embodied in the factory have been socialized.[17]

This can be seen today in the rise of the marketplace enterprise where these processes are controlled through

16 Maurizio Lazzarato and Timothy S. Murphy, "Strategies of the Political Entrepreneur". Substance 36 University of Wisconsin Press (2007): 88. http://www.jstor.org/stable/4152855.

17 Marx, *Grundrisse*, 622.; Negri, *The Politics of Subversion*, 57-58.

the interface,

> *"Uber, the world's largest taxi company, owns no vehicles. Facebook, the world's most popular media owner, creates no content. Alibaba, the most valuable retailer, has no inventory. And Airbnb, the world's largest accommodation provider, owns no real estate. Something interesting is happening."*[18]

In the case of Uber, users can request a ride to a location and the driver will pick the user up, drop them off and get paid via an app. A mobile application enables the transaction for which Uber can charge a percentage fee. Drivers use their own vehicles, pay for insurance, find customers, and markets themselves while Uber simply creates the interface in which users can connect to each other. These enterprises capture value through the control of the flows of exchange rather than the creation of a physical or intellectual commodity. They are accumulating surplus value from the autonomous working class by controlling the flows of production.[19] This marks a shift from the control over the means of production in the industrial economy to the control of the interface and the

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18 Tom Goodwin. "The Battle Is for The Customer Interface." TechCrunch.https://techcrunch.com/2015/03/03/in-the-ageof-disintermediation-the-battle-is-all-for-the-customer-interface/

19 Lazzarato, "The Political Entrepreneur", 88.

Fig. 1.4 Uber App

flows of production in the virtual economy.

While these companies largely operate within the virtual, many have invested heavily in physical infrastructures and the built environment from campus headquarters and downtown offices to physical hardware technologies. For example, Uber has invested in a $250 million office in San Francisco and are moving into the development of driverless vehicles.[20] Meanwhile, Amazon, a marketplace which has previously operated exclusively online, has begun to build brick and mortar retail outlets. [21] This process of capital circulation into the built environment is explained in David Harvey's diagram of the Circuits of Capital. Capital flows to various 'circuits' as temporary solutions to problems of capital overaccumulation. The primary circuit involves the investment in basic commodity production. Too much growth in this circuit results in overproduction and falling rates of profit. As a temporary solution, capital

20 Chris O'Brien, "Inside the $250M Uber is Spending on its New San Francisco and Oakland Offices," VentureBeat, March 02, 2016, https://venturebeat.com/2016/03/02/inside-the-250m-uber-is-spending-on-its-new-san-francisco-and-oakland-offices/.

21 Alexandra Alter and Nick Wingfield, "A Trip Through Amazon's First Physical Store," The New York Times, March 10, 2016, https://www.nytimes.com/2016/03/12/business/media/a-virtual-trip-through-amazons-physical-store.html?_r=1.

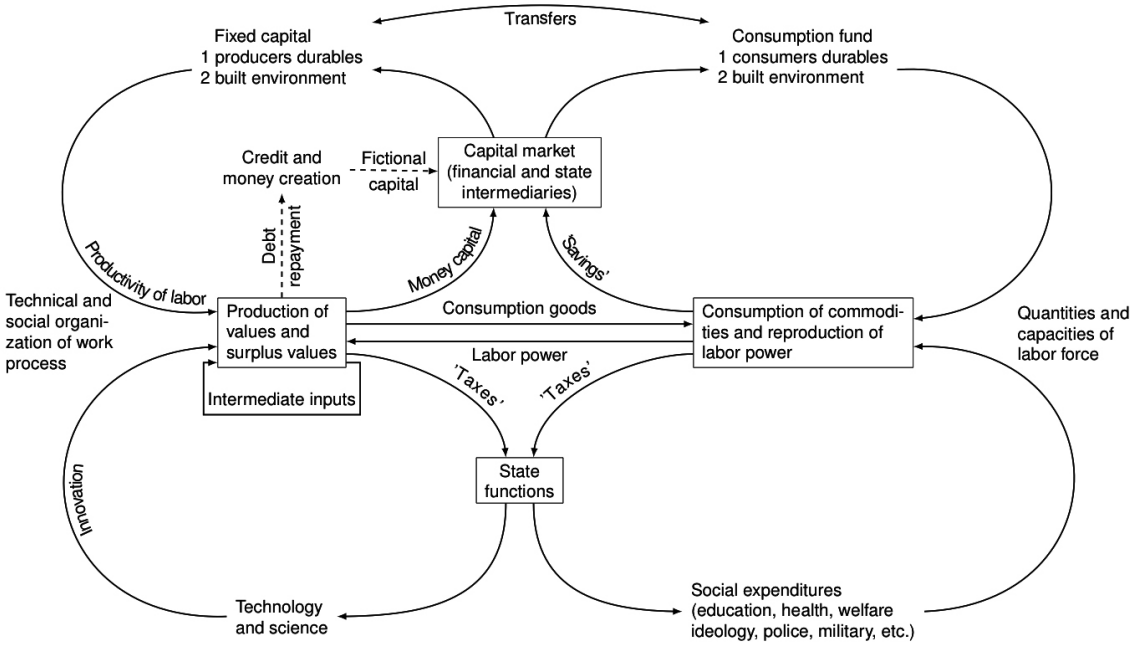

Fig. 1.5 Structure of Relations- Circuits of Capital by David Harvey

is moved into the secondary circuit in fixed capital and a consumption fund.[22] Overaccumulation in the secondary circuit results in the movement of capital to a tertiary circuit and the investment in technologies that increases labour's productivity. Contradictions in the built environment emerge as fixed assets can become devalued when there is an overinvestment in them or new assets render the old obsolete. Capitalists' desire to protect their investments discourages them from developing new and more productive forms of fixed capital, yet the logic of competition requires such developments. This is evident in the early transformation of Uber in acknowledging that emerging driverless vehicle technology is a potential threat to their business as Uber's Chief Product Officer Jeff Holden asserts,

> *"That is not a situation where the tech is going to be evenly distributed. Whichever company can build driverless cars will have a unique edge over competitors."*[23]

Unable to ensure control over the distribution of

22 Fixed capital includes buildings, tools and equipment, while the consumption fund involves commodities that aid in the consumption of capital.

23 Kia Kokalitcheva, "Here's Why Uber Is Building Its Own Driverless Cars," Fortune, June 14, 2016, http://fortune.com/2016/06/14/uber-driverless-cars-holden/.

transportation services, Uber must develop new forms of technology even if it destroys the current system they operate within. To maintain control over the flows of production, distribution and exchange, the company must develop technology to ensure their *access* to it as intellectual property. Ultimately, just as automation replaced the industrial worker in the factory, this sets the stage for the working-class driver, to be replaced by the automated vehicle. These workers lack job security and are left to provide their own means of transport, find customers, and market themselves in a system that is moving to replace them at any moment.

The emerging working condition of the virtual city is an existence without predictability or security, an age of precarity.[24] In the industrial city, the proletariat were unable to own the means of production and sold their labour to live. However, in the virtual city the precariat must sell their labour, subjectivity and often must take on unpaid or underpaid activities to retain access to jobs and livable wages. As David Harvey describes,

24 Guy Standing, *The Precariat: The New Dangerous Class* (London: Bloomsbury, 2016),1.

> *"The important and ever-expanding labor of making and sustaining urban life is increasingly done by insecure, often part-time and disorganized low-paid labor. The so-called "precariat" has displaced the traditional "proletariat."*[25]

This can be seen with the rise of internships, temporary work, freelancing, and the invasion of social media and marketing in our everyday lives.

As workers must sell more of themselves to earn a living wage, human relations are being commodified into long term commercial relations. Mass marketplaces are replaced by the individual as a market in the commodification of human experience and time. Capitalists seek to transform all social relations into commercial relations.[26] A new set of social and technical relations of production has emerged in which individuals redefine themselves by buying experiences to construct their self-image.[27] Physical and virtual spaces become powerful communicative tools that shape human perception and mass intellectuality. Spatial

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25 David Harvey. *Rebel Cities: From the Right to the City to the Urban Revolution*. Brooklyn: Verso, 2013, xiv.

26 Jeremy Rifkin, *The Age of Access*, 9.; Michael Hardt and Antonio Negri, Empire (Cambridge, MA: Harvard University Press, 2006), 386.

27 Rifkin, *The Age of Access*, 216.

Fig. 1.6 Uber Drivers Protest Working Conditions in California

production and spaces of production create the framework for people to act and shape their lives. However, if left unmanaged, these spaces of production can succumb to corporate control leaving the actors as producers of the corporate agenda, as merely agents in a machine used to accumulate capital.

With the shifting nature of labour, exchange and social or work relations, there is a danger in even greater capitalist totalizing control but there is also an even greater opportunity for individual autonomy. As Gilles Deleuze and Felix Guattari asserts, capitalism is not without its contradictions as its failure will be due to its own 'excess' and 'unserviceability'.[28] The very forces that seek to accelerate capitalism will cause its overaccumulation and collapse but with it there is a potential for emancipatory practice.[29] In the collapsing of the social and commercial spheres, capitalists seek to extract profit in all areas of private life. However, the dematerialization of labour, exchange and

28 Gilles Deleuze and Félix Guattari, Anti-Oedipus: Capitalism and Schizophrenia (Minneapolis: University of Minnesota Press, 1983), 152.

29 Robin Mackay and Armen Avanessian. #Accelerate: The Accelerationist Reader. Falmouth, United Kingdom: Urbanomic Media, 2014, 16.

the integration of commercial and public spheres provides an opportunity for the worker to mobilize the means of production for their own use. The proliferation of networks in the distribution of knowledge, tools and organization of labour has democratized many aspects of the means of production. Architecture and physical space, on the other hand, have remained under capital control. However, in the age of precarity, the working class must not only own the means of production in its totality but also control and manage the flows of production and the system in which they're operating. The rise of the precariat class and the emerging class struggle with the new neoliberal corporation can become a catalyst for social change. To this end, the virtual city requires new physical and virtual spaces or networks of production that frees the precariat worker, providing all means of production and the return of production towards use values and social ends.

Spaces of Production in the Virtual City

The industrial city was defined by physical property relations and the acquisition of goods to define one's self. Fueled by this notion, individuals enter the cycles of capitalist accumulation with the promise of future security by obtaining wealth and financial stability. By entering the cycles of capital, increasing pressures to consume force further accumulation in a continuous cycle of accumulation to no ends. The generation of the new millennia has witnessed this economic collapse to an accelerated degree. The proliferation of credit, loans and lending have provided new means for capital to reinvest and reinvent itself in the cycles of production. In the hypercapitalist economy, money capital has become so disconnected in exchange that its value is no longer understood. In an immaterial economy, an economy based on knowledge assets and social connections, money capital can no longer measure the value of immaterial labour and property. New corporations receive hyper-valuations without any evidence of exchange or use value, sold based on promises of capital gain and fueled by more capital injected by incoming investors. This inability to measure value has the potential to result in distorted corporate valuations and devastating economic failure. If money capital cannot provide the means to measure true value, productivity or

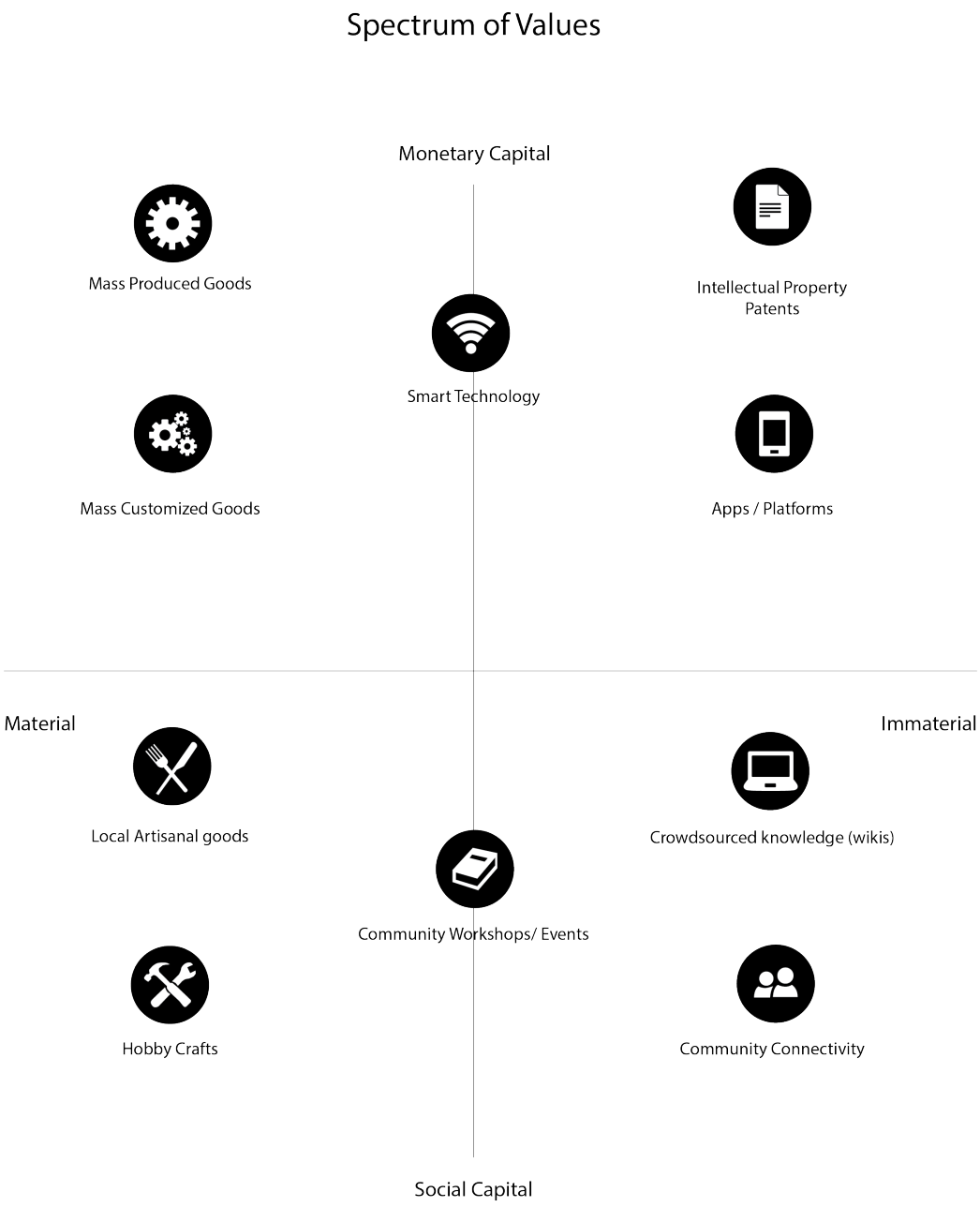

Fig. 1.7 Spectrum of Values

growth in the virtual city, an alternative value system must be created to capture these new flows of production and creation. The return of use values and the emergence of social values can provide new ends for the labour force to collectively organize towards. New spaces of production must accompany this new value system. In the virtual city, the laboratory is the defining space of production, a place to labour and the machine that mobilizes collective labour towards a common social purpose in the creation of use values and self-valorization.

Fig. 1.8 The Electrical Engineering Lab at MIT, 1902

The Laboratory Type

Early laboratories consisted of a room or building for the practice of alchemy and the preparation of medicines.[30] As technology advanced, these rooms were equipped for carrying out scientific experiments or procedures, especially for the purposes of research, teaching, or analysis. With the high costs and need for specific expertise for use of equipment, machinery and facilities, the laboratory remained the domain of institutions and business corporations.[31] Historically, laboratories were

30 "laboratory, n.". OED Online. June 2016. Oxford University Press. http://www.oed.com/view/Entry/104723?redirectedFrom=laboratory

31 "Digital Reality A Conversation with Neil Gershenfeld." Edge.org. January 23, 2015. https://www.edge.org/conversation/neil_gershenfeld-digital-reality.

isolated from the city and located in suburban areas, due to specificity of work processes and the hazards of contamination.[32] However today, research institutes have relocated near urban amenities to attract highly skilled knowledge workers. By bringing related academics and institutes together, new networks of knowledge exchange are embedded in the city.

Today, the lab has branched off into a growing number of fields: engineering, social innovation, finance where each space has a specialized set of equipment according to their methodological approach. The following pages will describe new forms of laboratory spaces that have emerged from the bottom-up formation of communities interested in the physical experimentation in material culture.

32 Yana Petrova and Yu-Hsiang Hung. "Laboratory." Projective Cities. http://projectivecities.aaschool.ac.uk/portfolio/laboratories/.

Fig. 1.9 Hacklab.TO Hackerspace in Toronto

Hackerspace

Derived from the programming term 'hacking', to modify a computer program in a skillful or clever way,[33] hackerspaces emerged around 1995, as a physical space for computer programmers to collectively work. Hackerspaces tend to be non-profit collectives with an informal community focused on computer technology. Later spinoffs added electronic circuit design and manufacturing, directly related to the initial programming focus, and physical prototyping to inclusion of activities in spaces[34] The evolution of the

33 "hacking." Dictionary.com Unabridged. Random House,Inc. http://www.dictionary.com/browse/hacking

34 Gui Cavalcanti "Is It a Hackerspace, Makerspace, TechShop, or FabLab?" Make: DIY Projects and Ideas for Makers. N.p., 22 May 2013. http://makezine.com/2013/05/22/the-difference-between-hackerspaces-makerspaces-techshops-and-fablabs/

Fig. 1.10 MIT Media Lab

term 'hacking' coincides with the expansion of the term to include working on physical objects and hardware.

Fabrication Lab

The first fabrication lab was built in 2001 at the MIT Centre for Bits and Atoms for research in digital fabrication.[35] In 2002, the "How to Make Almost Anything" class was developed for students to conduct research on the use of the machines but it became so popular that the course became part of the MIT curriculum.[36] Today, fabrication labs refer to openly accessible public spaces that feature

35 "Fab Lab FAQ." The Centre for Bits and Atoms. http://fab.cba.mit.edu/about/faq/.

36 Isaac Chuang and Neil Gershenfeld. MAS.863 How to Make (Almost) Anything. Fall 2002. http://ocw.mit.edu. License: Creative Commons BY-NC-SA

Fig. 1.11 KwartzLab Makerspace in Kitchener

specific physical tools and software: a laser cutter, computer numerically controlled (CNC) machine, a sign cutter, a precision (micron resolution) milling machine, and programming tools.[37] Because all Fab Labs share common tools and processes, the program is building a global network, a distributed laboratory for research and invention.[38]

Makerspace

The makerspace is an evolution of the hackerspace with the introduction of 'craft' and more traditional tools. The use of the term 'making' came into existence around 2011

37 "What Is a Fab Lab?" Fab Foundation. http://fabfoundation.org/fab-labs/what-is-a-fab-lab/.

38 Ibid.

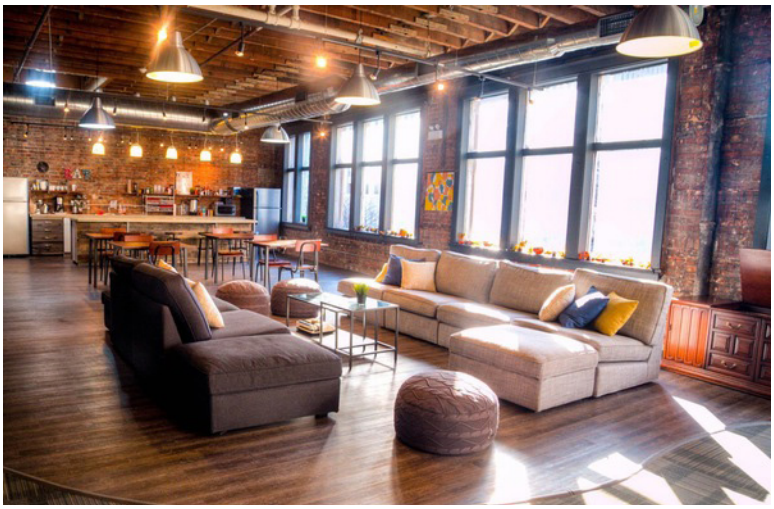

Fig. 1.12 Comotion on King, Coworking Space in Hamilton

as a more inclusionary term that incorporates both physical and digital products and coincided with the release of MAKE magazine by Dale Dougherty.[39] Makerspaces range in scale from grassroots community groups sharing donated or collectively purchased tools to businesses like Techshop who run large facilities and sell memberships in exchange for access to industrial grade machining and digital equipment.

Coworking Space

The term coworking was popularized by Brad Neuberg in 2005 with the goal of combining the freedom of working independently with the structure and community of working

39 Gui Cavalcanti "Is It a Hackerspace, Makerspace, TechShop, or FabLab?"

Fig. 1.13 Communitech Rev Accelerator

with others.[40] Coworking involves the creation of spaces for individuals to work independently but are interested in the synergies that can happen within a community of individuals who work alongside each other.[41] These spaces typically attract work-at-home professionals, freelancers, people who travel frequently and work in relative isolation but have recently outposts for large corporations to feed off the creative energy of a coshared environment. For freelancers, coworking workspaces provide a more

40 Carsten Foertsch and Remy Cagnol. "The History Of Coworking In A Timeline." Deskmag. September 02, 2013. http://www.deskmag.com/en/the-history-of-coworking-spaces-in-a-timeline

41 Julie Farby. "The Hive Hopes To Revolutionize Traditional Office Space By Creating "Coworking" Space." AHN. March 13, 2007. http://web.archive.org/web/20070317225120/http://www.allheadlinenews.com/articles/7006731137.

professional work environment and frees workers from isolation or distractions from home.

Incubator/Accelerator

Incubators are facilities to nurture startup businesses during their first months or years in development. They usually provide affordable space, shared offices and services, hands-on management training, marketing support and, often, access to some form of financing.[42] Startups accepted into incubator programs often relocate to a specific geographic area to work with other companies in the incubator.[43] A typical incubator has shared space in a coworking environment and some connection to the local community while more specialized incubators may include workshops, makerspaces, or labs geared towards a specific field. Accelerators are programs usually with a set timeframe in which individual companies spend several months to a year working with a group of mentors to build

42 "business incubator". BusinessDictionary.com. WebFinance, Inc. http://www.businessdictionary.com/definition/business-incubator.html

43 Conner Forest. "Accelerators vs. Incubators: What Startups Need to Know." TechRepublic. November 17, 2014. http://www.techrepublic.com/article/accelerators-vs-incubators-what-startups-need-to-know/.

out their business.[44] Some accelerators provide coworking space or private office space or companies may have to seek it out on their own.

Hackerspaces and co-shared workspaces emerged from the desire for co-learning, co-locating and to share resources and equipment to enable an informal laboratory and testing grounds for ideas in the computer sciences. At the same time, institutions have developed further specializations in the laboratory type such as the fabrication lab at MIT, focusing on the various aspects of making things. The manufacturing of low cost tools and equipment and the proliferation of knowledge through digital networks has given unprecedented access to information turning the city into an urban laboratory. Hybridized typologies have emerged combining the traditional workshop and lab into makerspaces. These spaces range in scale and infrastructure from the domestic garage workshop to design collectives and community organizations to large scale manufacturing complexes.

44 Ibid.

Network of Production

There is a potential to mobilize the informal, local and small scale domestic workshop, design collective, or makerspace into a specialized production network. While Accelerationists such as Guattari argue that the small and temporary spaces of non-capitalist relations are "eschewing the real problems entailed in facing foes which are intrinsically non-local, abstract and rooted deep in our everyday infrastructure"[45] , these small-scale actions provide a layer of community participation towards a larger movement in search for a post-capitalist solution. Economist Richard D. Wolff argues that:

> *"re-organising production so that workers become collectively self-directed at their work-sites" not only moves society beyond both capitalism and state socialism of the last century, but would also mark another milestone in human history, similar to earlier transitions out of slavery and feudalism."*[46]

It is through the connectivity of the network of self-organized actions that can grow into larger and potentially longer term actions or organizations that can create change. Such a network can collectively share social, capital, and knowledge resources to reach economies of scale that

45 Robin Mackay and Armen Avanessian. #Accelerate, 29

46 Richard D. Wolff. Democracy at Work: A Cure for Capitalism. Chicago, IL: Haymarket Books, 2012.

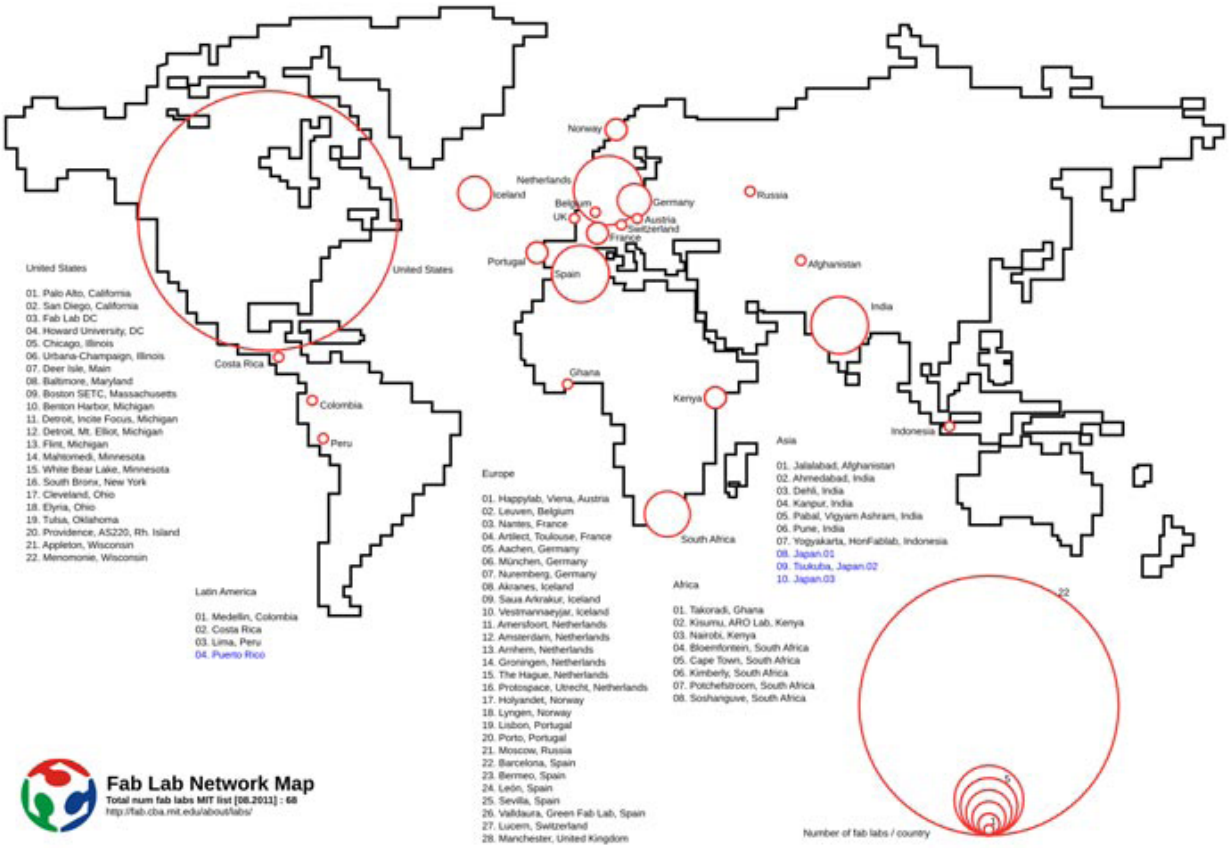

Fig. 1.14 Fab Lab Network Map

allows the testing of ideas outside the domain of a capitalist market to be economically viable and sustainable. Within this system, a production and manufacturing network both supports the values of economic growth while also encouraging the open source movement. On the one hand, products can be designed, tested and sold on the market much quicker providing an unprecedented economic advantage in the western economy. On the other hand, this decentralized manufacturing network can democratize access to the means of production and propel the creative class to innovate and create as acts of expression as well as a means to sustain their livelihood. As accelerationists' Robin Mackay and Armen Avanessian describe:

> *"This invocation of the open-source movement is a powerful reminder that there are indeed other motivating value systems that may provide the "libidinizing impulse'… in the search for alternative constructions;"*[47]

It is at this intersection that artists, makers and creatives can set the stage for a twenty-first century industrial revival by reintegrating industry and urban manufacturing into the city. At a larger scale and in following the Accelerationist's Manifesto, a post-capitalist revolution must focus on the

47 Robin Mackay and Armen Avanessian. #Accelerate, 28-29.

following three objectives[48]:

1. Reconstitute various forms of class power

The social organization of groups and institutions must be reconfigured for the proletariat and precariat class to operate within.

2. Building intellectual infrastructure

New systems and institutions must be created to prototype and bridge the theory and practice of post-capitalist ideologies, economic and social models.

3. Re-appropriation of fixed capital[49]

The re- appropriation of productive capacity by reclaiming fixed assets such as buildings, machinery, infrastructure, information technologies, software, patent, etc. by the collectivity of workers.

The community needs to be empowered and educated to

48 The three objectives below are based on Alex Williams and Nick Srnicek, *"#Accelerate: Manifesto for Accelerationist Politics,"* in #Accelerate: The Accelerationist Reader (Falmouth, UK: Urbanomic Media), 359-360.

49 "fixed capital" refers to money invested in fixed assets as opposed to "circulating capital' which includes raw materials and workers' wages

take action to form new spaces of production that directly address their community needs. A do-it-yourself(DIY) guide has been developed to provide an overview on the principles of the three objectives in developing a self-organized space:

1. Organizational knowledge in the assembly of a team, working dynamic and legal structure towards a cooperative space.
2. Spatial knowledge in the planning and identification of appropriate sites for community use.
3. Financial knowledge in the acquisition of fixed capital and alternative funding mechanisms.

Only when an organization can move the community towards the collective desire for a post capitalist space of production can a traditional architectural design be developed. Therefore, to reimagine a post-capitalist architecture begins with the mobilization of the community towards self-organized and collective action. The following chapter examines the region of Kitchener-Waterloo as a post-industrial city and as a site for designing and prototyping a new model of production.

CHAPTER 2:

KITCHENER THE CREATIVE CITY

History of the Kitchener Region

The city of Kitchener was founded on its industrial and cultural roots that brought together the community towards a collective vision of success. The village grew into a city and its success could be charted by the number of factories interspersed in the urban landscape. Without any dominant natural features or landmarks these factories became the defining architectural artifacts that characterized the city. Industry and culture were one and of the same. However, industrialization created a divide between technology, making and the arts. Once practiced as means of expression, these fields were separated into distinct commercial industries. The following chapter examines the growth of industry in the city of Kitchener and Waterloo Region and how early industrial development continues to characterize the urban fabric today. The

Fig. 2.1 1959 B.F. Goodrich Plant at King &Victoria, Kitchener

chapter also examines how the industrial dominance at the centre of the twin cities of Kitchener and Waterloo propels the economic growth of the region even as it shifts towards a service and technology focused economy. Therefore, as capital increasingly centralizes at the centre of the city, the strategic intersection of arts, culture and industry must be re-examined to develop a city that provides more than a place to inject capital but rather a place to develop economic growth and success through social inclusion, cooperation and diversity. The city needs new spaces of production to once again bring together industry and the arts to form the culture and community that defined the initial founding of the city.

The site where Kitchener eventually developed was a six hundred-thousand-acre tract set aside by the British Crown in 1784 for the Six Nations to reward them for their loyalty during the Revolutionary war and to compensate for the land they lost to the United States.[1]While the site was relatively isolated away from major commercial centres along the lakefront, this proved advantageous to a group of in Pennsylvanian Mennonites looking to practice their

1 William Velores Uttley. *A History of Kitchener, Ontario*. Waterloo: Wilfrid Laurier University Press, 1975,7.

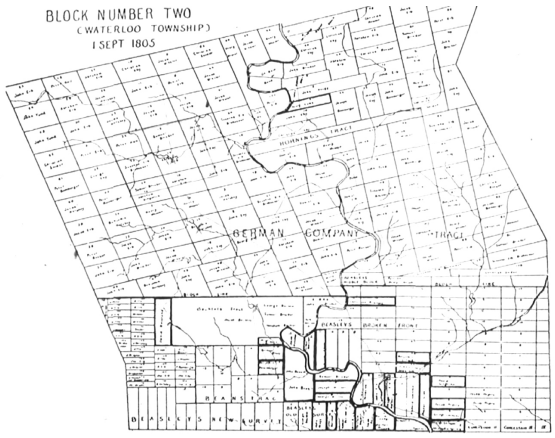

Fig. 2.2 1805- Block Number Two Waterloo Township

faith and escape the threats of persecution. Together they formed the Germany Company tract to acquire the land to be evenly divided amongst the families. Immigration from Pennsylvania continued until the 1820s. By then a new wave of immigration began, largely comprised of Europeans of German descent, as they were attracted by affordable land, a market for their skills in a place with a similar culture to their homelands. With the influx of new immigrants, the area became known as Berlin.[2] They dramatically changed the lifestyle of the township:

> *"Whilst the Pennsylvania Germans and Mennonites were mainly interested in agriculture with only a few trained as millers, blacksmiths, weavers, shoemakers, tailors, carpenters,*

2 John English and Kenneth McLaughlin. *Kitchener An Illustrated History.* Toronto: R. Brass, 1996, 22.

Fig. 2.3 Factory Workers

> *and the like, the European Germans, who began to arrive in the 1820s, were only incidentally interested in farming. The majority of them were tradesmen, artisans and craftsmen, and industrialists, eager to make use of the opportunities that seemed to lie in Waterloo township…"*[3]

Even in its early years, the village was made up of makers or the "creative class" of the time. They founded the local small industries that eventually became the large industrial factories in the post-war period. In the early 1850s, Berlin was much smaller compared to the neighbouring towns of Preston and Galt. However, growth continued steadily with the city's ability to attract newcomers based on its political influence as the county seat and for its German

3 E.A. Haldane, "The Historical Geography of Waterloo Township, 1800-1855" (M.A. thesis, McMaster University, 1963), 39.

culture and religion that produced a unique community in Southern Ontario. Many of these newcomers, "… became entrepreneurs as well as tradespeople. Over the years they established a wide variety of locally owned and family operated businesses in the city."[4] The county seat proved advantageous as it garnered a stop on the Grand Trunk Railway connecting Toronto to Sarnia and Berlin to a large national market. The railway proved advantageous for Berlin, leading to land speculation and subdivision in the northern area of the village at the intersection of the main arterial road and the newly built railway.[5] Though industrial development didn't start right away, this would later provide the sites for factories and housing when Berlin expanded in the 1870s. The building of the railway increased confidence and further attracted people to the city:

> *"Berlin's growth had been based largely on an evolution of small local businesses, expanding to take advantage of a growing Canadian market; it had often involved entire*

4 Bill Moyer. *Kitchener Yesterday Revisited An Illustrated History*. Kitchener: Kitchener Chamber of Commerce, 1979.

5 Elizabeth Bloomfield, "Building Industrial Communities: Berlin and Waterloo to 1915," in *Manufacturing in Kitchener-Waterloo: A Long-Term Perspective*, ed. David F. Walker (Waterloo: Dept. of Geography, University of Waterloo, 1987), 31.

Fig. 2.4 1857 Berlin and Waterloo

families, and it was financed primarily by local investment with only one or two companies coming to Berlin from outside"[6]

Despite its large number of establishments and workers, Berlin's merchants and industrialists were part of what was still a very small community, with many of its measures of productivity lagging Waterloo. By the 1870s Berlin had 68 industrial establishments, 28 were one man businesses and 8 had 5-9 workers and only 4 had over 10 workers.[7] These smaller merchants developed an economy of specialization in the leather and woodworking crafts and later in felt and button-making. The period between 1870-1915 saw Berlin's industrial production increasing exponentially from a value of $323,819 to $16.4 million and the number of workers increasing from 306 to 5630.[8]

The smaller factories of Berlin followed a much more dispersed pattern of expansion which marked a key difference in the shaping of the urban landscape compared to the highly centralized development with fewer larger

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6 John English and Kenneth McLaughlin. *Kitchener An Illustrated History*, 68.

7 Elizabeth Bloomfield, in *Manufacturing in Kitchener-Waterloo*, 9.

8 Ibid, 10.

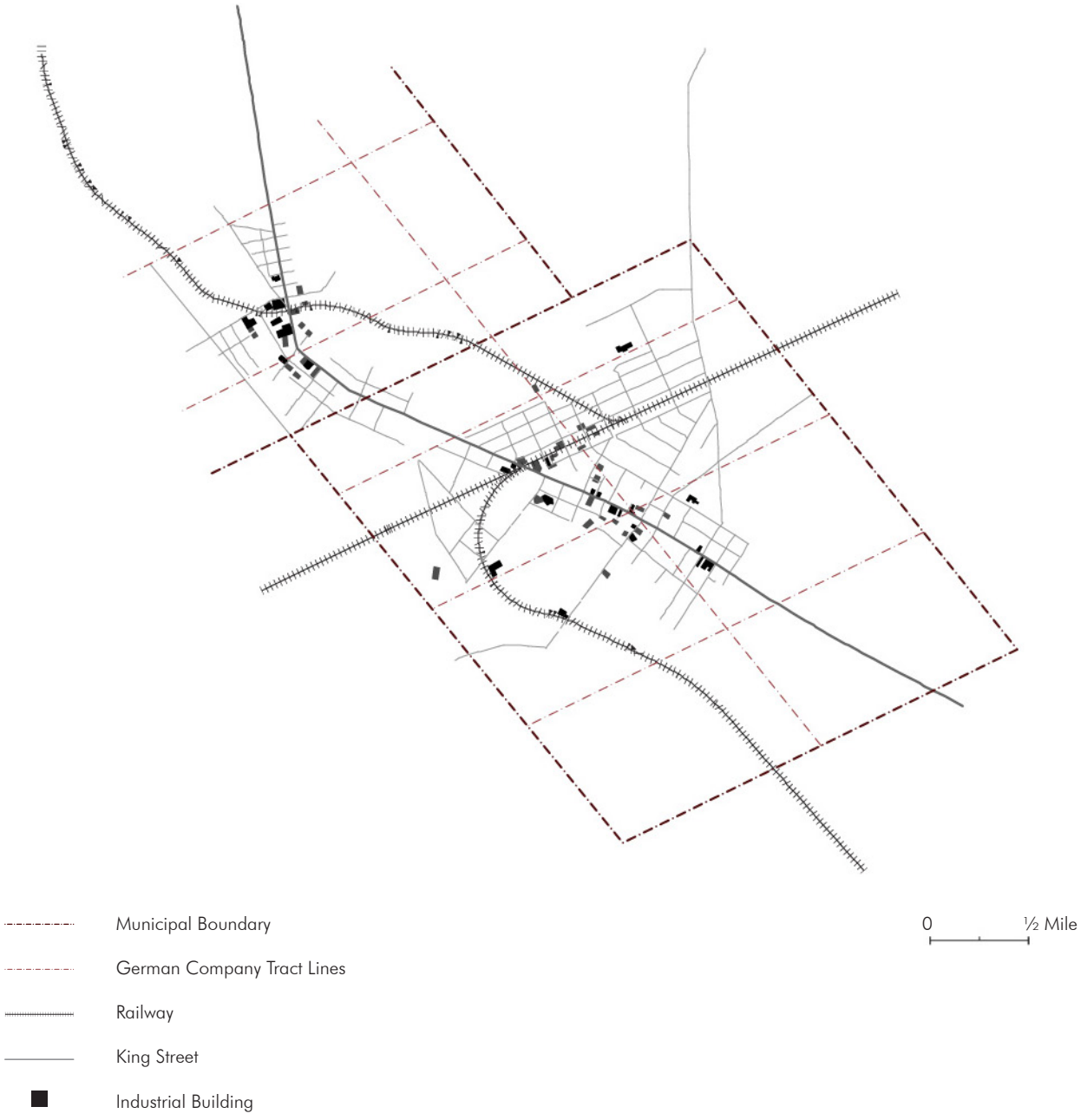


Fig. 2.5 1878-1897 Factories in Berlin and Waterloo

factories in Waterloo. Berlin's dispersed pattern can be attributed to its small initial industrial base followed by rapid industrial-urban growth and the distance between its commercial core and the main line of the Grand Trunk Railway.[9] The availability of large lots along the rail corridor attracted many factory expansions to the north of Berlin. Meanwhile, Waterloo was not linked to rail until 1878 which further encouraged the centralization of its industrial-urban development.

Local ownership of industrial enterprises and strong socio-cultural factors continued to attract individual and entrepreneurs to Berlin and Waterloo. This community culture was developed through the many festivals, notably Sangerfest, a traditional Germanic cultural festival, and the building of an exhibition hall in 1875 to display the town's diverse industrial products and as a venue for music festivals.[10] The exhibition hall brought together the two strengths of German tradition, arts and industry, in Berlin. In 1905, the first "Made in Berlin" exhibition, consisting of articles manufactured in town, was held in the exhibition hall and organized by the Berlin Musical Society. The

9 Ibid, 30.

10 William Velores Uttley. *A History of Kitchener*, 190

Fig. 2.6 1912- Map of Berlin Factories

integration of industry, culture and the architecture of the city reinforced the strengths of the community. The construction of the exhibition hall was the building of a bond between the industry and the arts.

A period of urban concentration occurred between 1897-1913 in Berlin with 16 new factories emerging between King Street and the city's east end.[11] The completion of the Grand River Railway to Berlin in 1903 and Waterloo in 1905 spurred new growth and clusters in each of the towns. Additional rail lines were also built to connect Waterloo to a cluster of old factories in Berlin's south western end. Factories began emerging in all parts of the region with the aid of non-restrictive zoning and building codes to allow industrialists to lay claim to preferred building sites, "In most big towns and cities factories congest in the extremities, usually the east end. Berlin's are everywhere"[12]. The integration of the factories interspersed in the urban fabric reflected the industrial integration into

11 Elizabeth Bloomfield, "The Maturing Industrial Economy: Kitchener-Waterloo, 1915-1945," in *Manufacturing in Kitchener-Waterloo*: A Long-Term Perspective, ed. David F. Walker (Waterloo: Dept. of Geography, University of Waterloo, 1987), 32.

12 John English and Kenneth McLaughlin. *Kitchener An Illustrated History*, 64

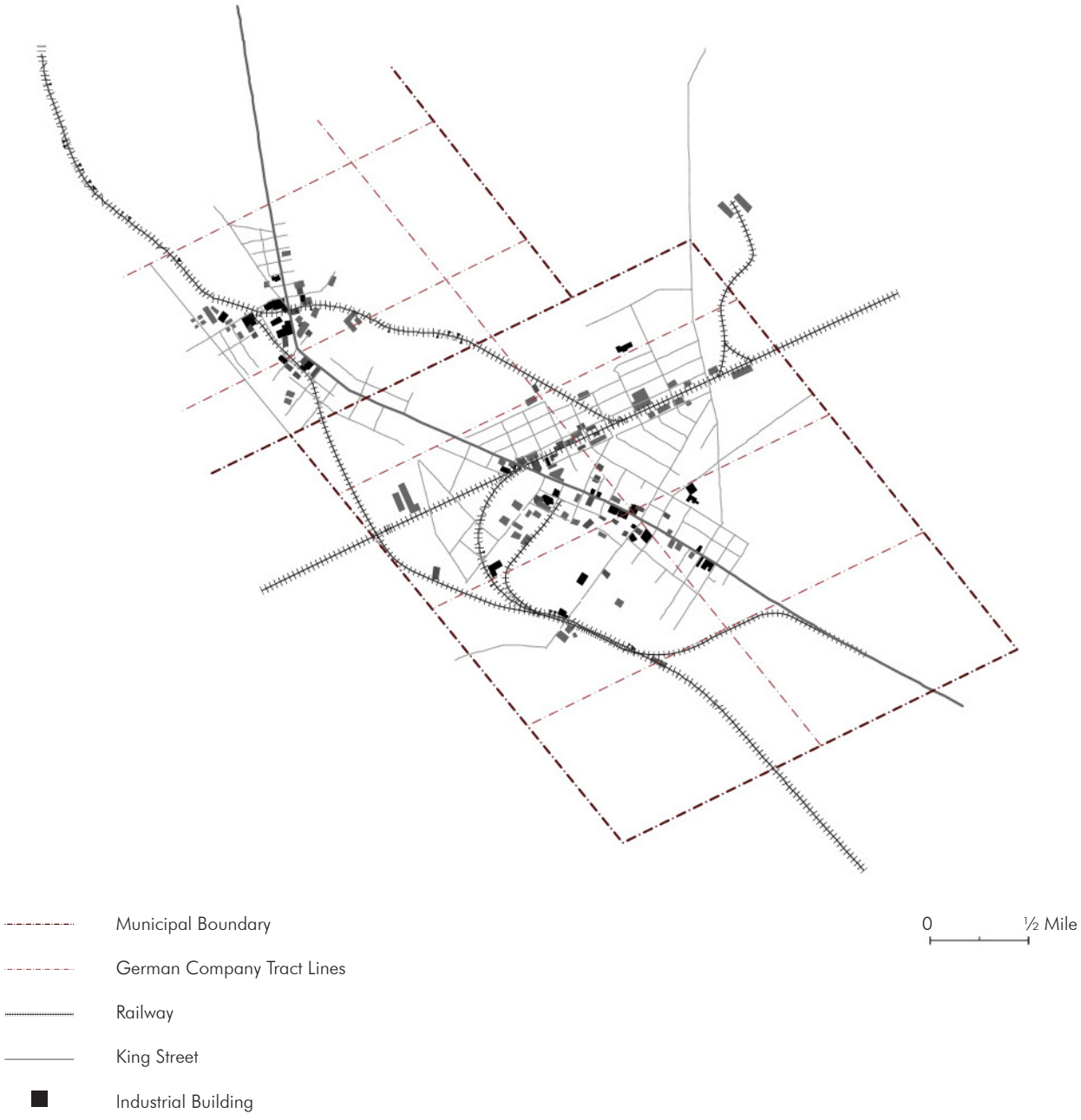


Fig. 2.7 1897-1913 Factories in Berlin and Waterloo

Fig. 2.8 1910- King Street Procession

the social fabric of the city. Locating the factories at the centre of the city ultimately provided an urban economic advantage, allowing people to build a community around both their work and social lives.

The growth of Berlin continued with its population finally reaching the status of a city in 1912. Clubs and festivals continued to bring the community together despite the emerging distinction between social classes. It was this sense of community life which had brought Berlin relatively unscathed through the challenging period between two wars. With the First World War, the cultural attitudes in the people of Berlin began to shift because of the apprehension of displaying German pride and the concern of anti-German sentiment affecting business,

Fig. 2.9 Kitchener in WWI

> *"…manufacturers got letters from customers all over the country saying they couldn't' sell goods with made-in-Berlin labels and their accounts would be withdrawn if the city didn't get rid of the name of the Kaiser's capital"*[13]

These concerns spread to the cultural associations as the Concordia Club and other German social clubs immediately closed down to prevent any misunderstandings of the city's loyalty. In 1916, after much controversy the city of Berlin changed its name to Kitchener. The changing of the city's name marked a significant shift in the culture and identity of the city and its homogenization through nationalization.

13 Edna Staebler. *The Story of Kitchener*. Kitchener: Kitchener Waterloo Record, 1962.

"Just as Canada was becoming more North American in its outlook, so too was Kitchener losing those styles and tastes that were European. Canada became less British, Kitchener more Canadian, but in both cases the death of the past was protracted."[14]

Kitchener followed what was characteristic of many other cities in Ontario as markets expanded across North America. Local ownership was still strong but increasingly affected by external influences. Between 1915 to 1945 manufacturing remained dominant in the urban economy but the service industry was growing at a faster rate. Within manufacturing, food, engineering and automotive related industries were growing much faster than the traditional industries of leathermaking, textiles and woodworking but they did continue to expand and diversify their offerings. Most notable was the rubber industry which became the leading local sector growing from 5.5% in 1911 to 30.6% in 1931.[15] The patterns of industrial development established in the earlier years continued after 1915,

14 John English and Kenneth McLaughlin. *Kitchener An Illustrated History,* 160

15 Elizabeth Bloomfield, "The Maturing Industrial Economy: Kitchener-Waterloo, 1915-1945," in *Manufacturing in Kitchener-Waterloo*, 37.

Fig. 2.10 1913-1927 Factories in Berlin and Waterloo

with factories clustering at Waterloo's commercial core while development in Kitchener dispersed as new lines of transportation opened newly accessible areas. One of such sites included Henry Nyberg's "South View" in southeastern Kitchener where he developed a scheme to subdivide a block of undeveloped land into many residential and a few industrial lots and to use the proceeds of land sales to potential homeowners or speculators to provide the capital to build and equip factories. Nyberg built his automobile plant in 1914 and convinced other businesses to develop in this part of the city.

Kitchener continued to attract large automotive and tire manufacturers to the city while at the same time many smaller companies in other industries were consolidating into larger enterprises as part of the 'merger movement'. The increasing number of mergers could be attributed to the aging, retirement or death of first generation Kitchener-Waterloo entrepreneurs in the period between 1910-1930. From the 1920s, several long-established factories were sold to outside interests that were often Toronto based. By the 1930s eight of Kitchener's factories were controlled or affiliated with U.S. corporations with employment

Fig. 2.11 Kaufman Plant Strike

amounting to one third of the city's industrial total.[16] However, most small to medium scale factories remained locally owned by families such as Lang and Breithaupt.

In parallel with the increasing level of outside ownership and management of industrial business came the development of international labour unions. With the continued centralization of capital and increasing tensions between unions and factory owners, several labour strikes ensued in the mid to late 1930s.

> *"The sooner the manufacturers come to their senses and admit the working man is a cog in the wheel, the better for them. Strikes are not the best thing for both parties. They cause trouble and create ill-feeling, but sometimes they are*

16 Ibid, 51.

necessary. You [the worker] have a right, however, to organize and the right to share in the profits in whatsoever industry you are working in."[17]

Labourers insisted on sharing the economic prosperity gained by the owners of large manufacturing industries in the city. Kitchener could not escape the class struggle created through industrial capitalism. However, labour peace came by the end of the decade with owners increasing wages and wartime prosperity flowing down the social classes. While the strikes were relatively short-lived, labour tensions would re-emerge in the post-war period of globalizing expansion, In the meantime, the increasing size of factories and general expansion across the cities, home-work relationships were beginning to change. The emerging middle class pushed for increasing division between residential and industrial zoning to separate pollutants but with limited growth in the 1930s, the urban landscape showed little change as can be seen in the 1945 map of the two cities.

In the post-war years, there was an increasing dispersion of industrial development from the central cores of

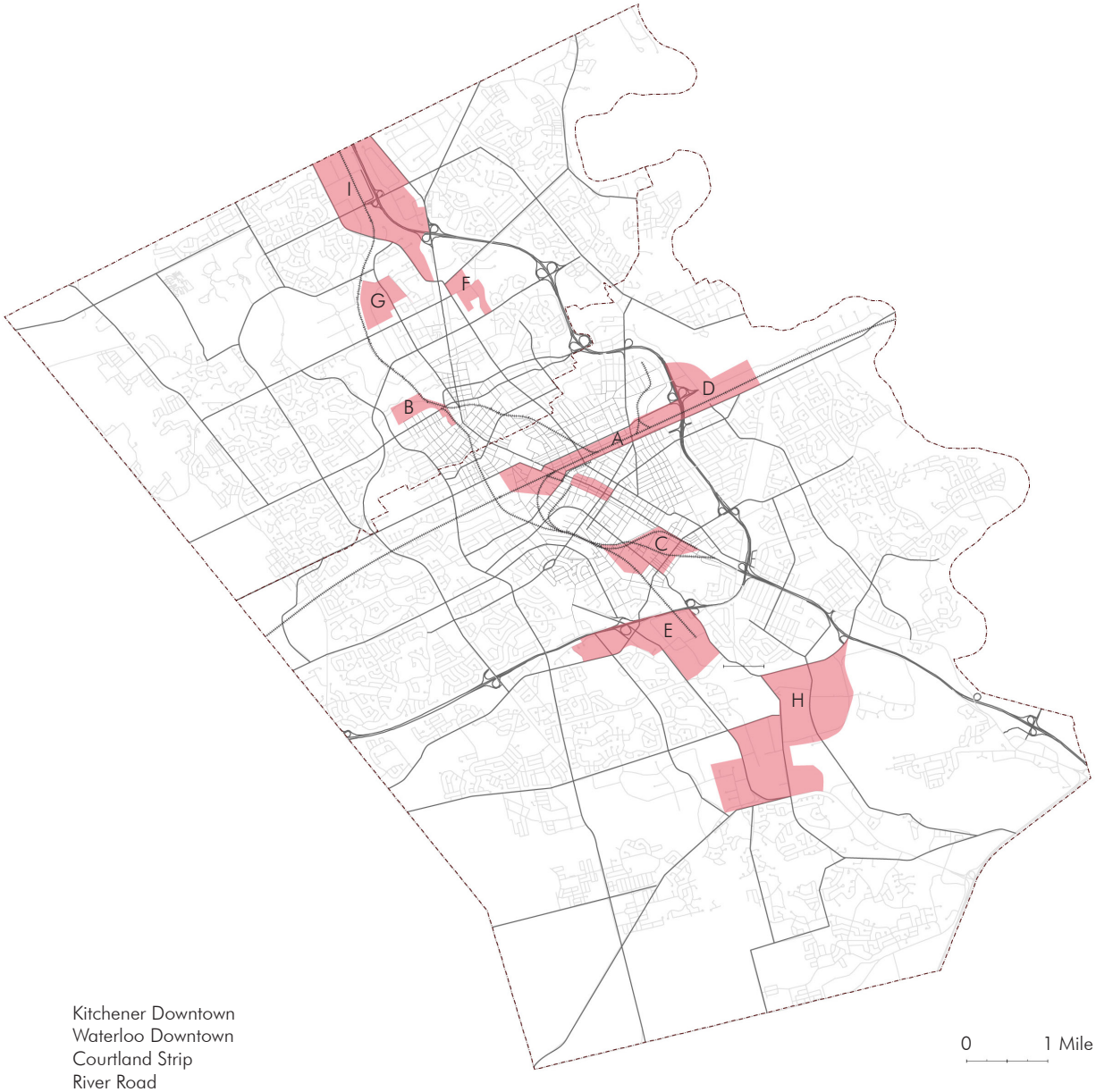
17 Daily Record (Kitchener), July 8, 1939

Fig. 2.12 1945 Kitchener-Waterloo

Kitchener and Waterloo. Expansion of the electrical, metals, machinery, and transport equipment sectors continued after the war, with particular specializations in communications and home entertainment equipment in the prominent Electrohome and Marsland Engineering companies at the time. The food and beverage industry also grew into the 1960s to account for over one-third of all new value added in the Kitchener manufacturing sector.[18] Expansion during this period was accommodated in unused industrial pockets such as on Kitchener's east end (Zone D). In addition, Ardelt industries began its operations on a small scale in 1955 and scaled to nearly 100 employees by 1957.[19] (Zone E) This district became a base for trucking companies and warehousing with the building of Highway 7 and 8 in the 1960s connecting Kitchener and Waterloo to Stratford and most of southern Ontario via the 401. Pressures for industrial expansion in the late 1960s led local manufacturing company B.F. Goodrich to establish a new factory by obtaining a 100-acre site in the south of Kitchener sparking an industrial

18 David F. Walker, *Manufacturing in Kitchener-Waterloo: A Long-term Perspective* (Waterloo: Dept. of Geography, University of Waterloo, 1987), 63.

19 *The Record*, 30 June 1978



A Kitchener Downtown
B Waterloo Downtown
C Courtland Strip
D River Road
E Ardelt
F University Area
G Marsland Area
H Kitchener Industrial Park
I Waterloo Warehouse Park

Fig. 2.13 1985 Kitchener-Waterloo Industrial Areas

Fig. 2.14 Former Boehmer Box Factory

park movement.[20] (Zone H) This coupled with existing companies feeling the restrictions in the lack of local land in more centralized locations and the limitations of the old multi-storey factories led to industrial expansion into the peripheries as new processing methods changed and single storey operations became more popular. Meanwhile, the industrial park movement spread to Waterloo where new districts around the University of Waterloo (Zone F and Zone G) and to the north of the city could accommodate newly built operations. The Northfield zone (Zone I) was almost entirely built after 1960 and where predominantly small operations presided with easy access via the Conestoga Parkway.[21] With the establishment of these new

20 David Walker, *Manufacturing in Kitchener-Waterloo*, 76.

21 Ibid, 78.

Fig. 2.15 Demolition of the John Forsyth Shirt Factory

districts, Waterloo's manufacturing sector grew at a much faster rate compared to Kitchener while industry continued to diversify with an increasing concentration of technology oriented firms that held strong links to the University of Waterloo.

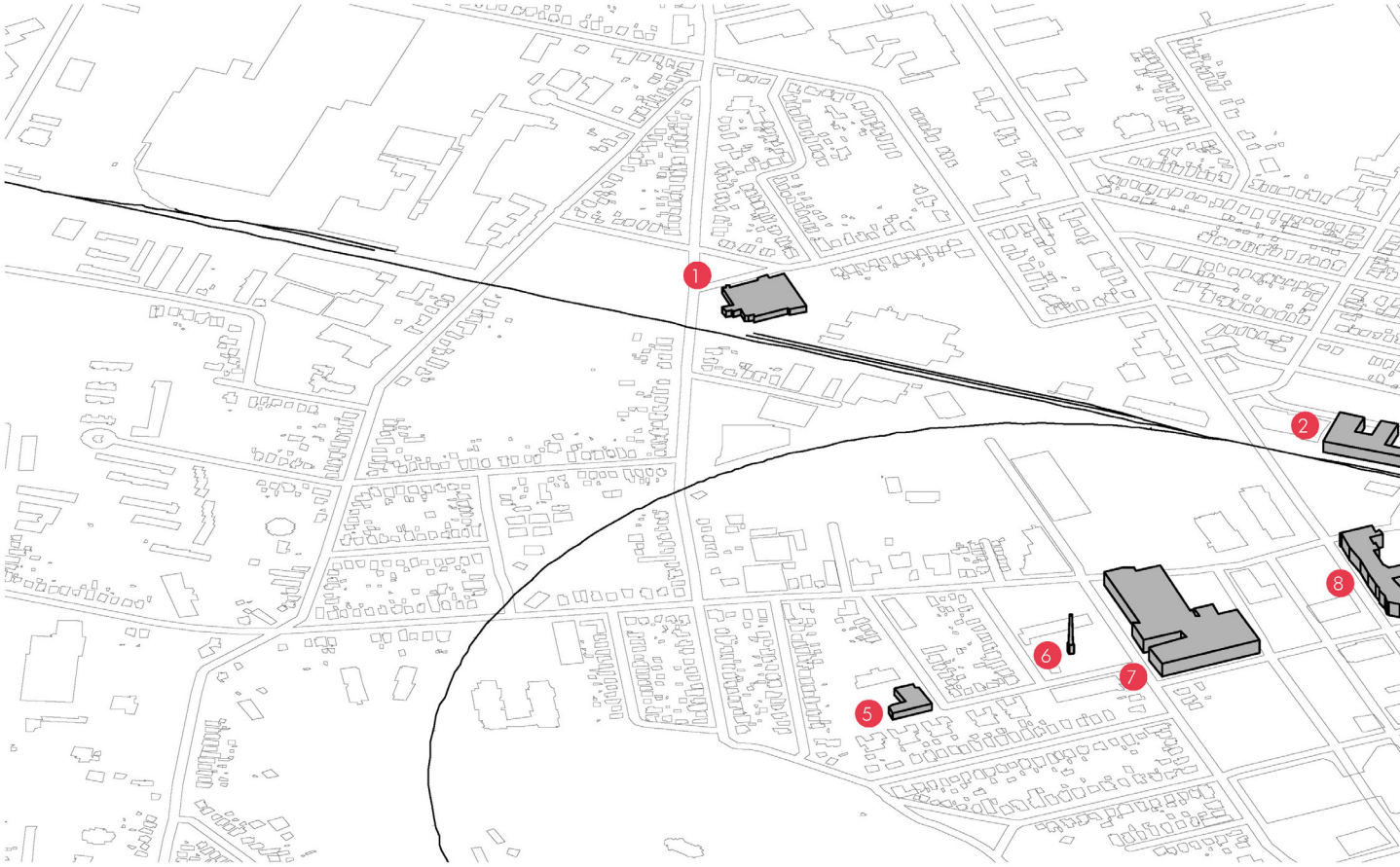
By the 1970s, many factories and industries were merging into larger companies while increasing foreign ownership. A 1971 study of Galt stated that 80% of industrial assets in Kitchener-Waterloo-Preston-Hespeler-Galt complex were controlled outside Canada[22]. On the other hand, Kitchener continued to have several major local companies owned and operated in the city including Schneider, Electrohome

22 John English and Kenneth McLaughlin. *Kitchener An Illustrated History,* 173.

Bauer Warehouse

1 69 Agnes Street

2 Dominion Tire Plant



5 5 Michael Street

6 Joseph Street Smokestack

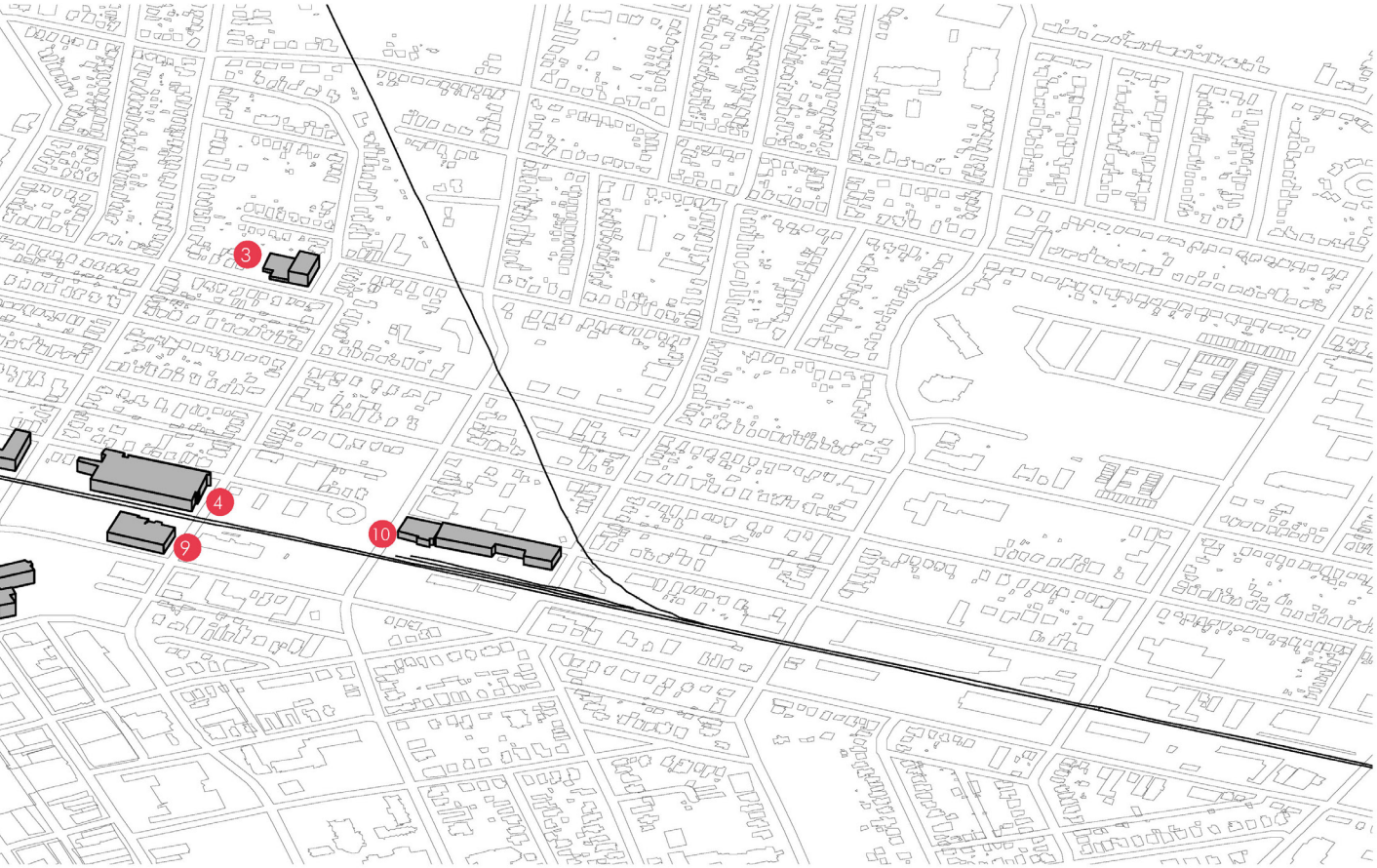
7 Lang Tannery

Fig. 2.16 Industrial Inventory Downtown Kitchener

3 Electrohome

4 Boehmer Box Factory

Seagram Distillery



8 Kaufman Rubber Company

9 Rumpel Felt Factory

10 Krug Furniture

Fig. 2.17 Former Dominion Tire Plant

and Kaufman Rubber. Despite of increasing foreign ownership, citizens were less concerned with the erosion of culture than the overall economic prosperity and attaining the richer material life sought out after the wars. In the 1980s, traditional industries which were labour-intensive faced international competition and lowering demand. Kitchener's tire industry suffered as a result of consolidation with international industry.[23] Many of the factories were not updated in the previous decade and with too many producers in the global market it brought the collapse of many of the button, shirt, leather and tire factories in the city. Traditional auto-frames manufactured locally were being replaced by smaller, cheaper half-

23 Ibid, 201

Fig. 2.18 Waterloo Research Park

frames that car manufacturers produced themselves.[24] With multiple recessions between the 1980s and 90s, the urban landscape became dominated by blocks of vacant factories. Every abandoned factory marked a loss in the industrial identity of the city.

> *"Ontario's problem is not unique... The rise of automation in manufacturing plants means that factories today have more robots and fewer workers. In the case of products that still require a lot of workers, jobs have been transferred out of wealthy countries to countries with much lower labour costs."*[25]

24 *The Record,* 27 June 1980

25 "How Ontario Lost 300,000 Manufacturing Jobs (and Why Most Aren't Coming Back)." Mowat Centre: Ontario's Voice on Public Policy. https://mowatcentre.ca/how-ontario-lost-300000-manufacturing-jobs/.

Fig. 2.19 Active Industrial Districts Kitchener-Waterloo

GRAND TRUNK CORRIDOR

DEMOGRAPHIC

corporations
artists
entrepreneurs
craftpersons
designers

TRANSPORT

RESOURCES

KEY INDUSTRIES

THE STOCKYARDS

DEMOGRAPHIC

craftpersons
artists
designers

TRANSPORT

RESOURCES

KEY INDUSTRIES

GOODRICH PARK

DEMOGRAPHIC

corporations
entrepreneurs

TRANSPORT

RESOURCES

KEY INDUSTRIES

Despite the appearance that Kitchener was suffering the same ill fate of many other rust-belt cities, the community remained resilient and adaptable to new industries in the service and high tech sectors. The establishment of business related institutes such as the Canadian Industrial Innovation Centre in the 1980s as well as the university research park in northern Waterloo created a cluster of new industry to the region. At the same time, global firms such as General Motors, NCR and Hewlett Packard were setting up local subsidiaries to take advantage of the local computing and engineering talent in the region. Similar to its early years, the main attraction to Kitchener-Waterloo continued to be its people. The University of Waterloo, Wilfrid Laurier University and vocational programs from Conestoga College contributed to an increasingly skilled labour supply that gave the region a comparative advantage in labour relations, costs and productivity over many Ontario regions.

"The greatest product which we will realize from our electronic era is the better educated race," said Ira Needles, president of B.F. Goodrich Canada, in a 1956 speech that helped lay

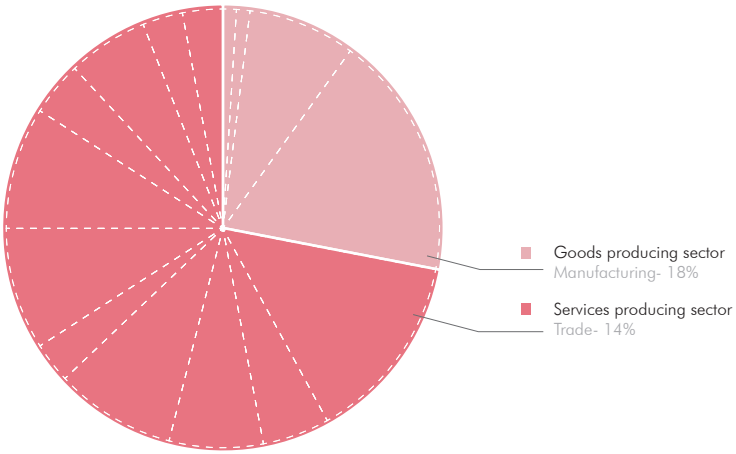


Fig. 2.20 Kitchener-Waterloo Region Employment by Industry

the foundation for the University of Waterloo.[26]

In 2012, manufacturing continued to make up the largest employment sector, employing over 20% of the city's labour force.[27] With manufacturing continuing to make up the largest employment sector in the city of Kitchener, the maker movement provides an opportunity for the community to reclaim its cultural roots in craft, artistry and industry to develop a new engine for economic growth by partnering with the growing arts, design and innovation communities.

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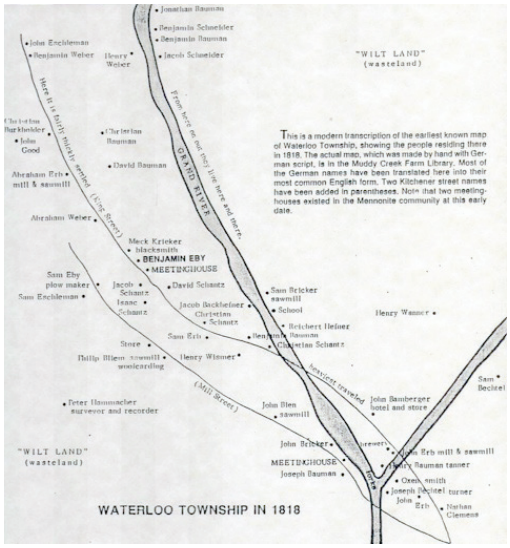
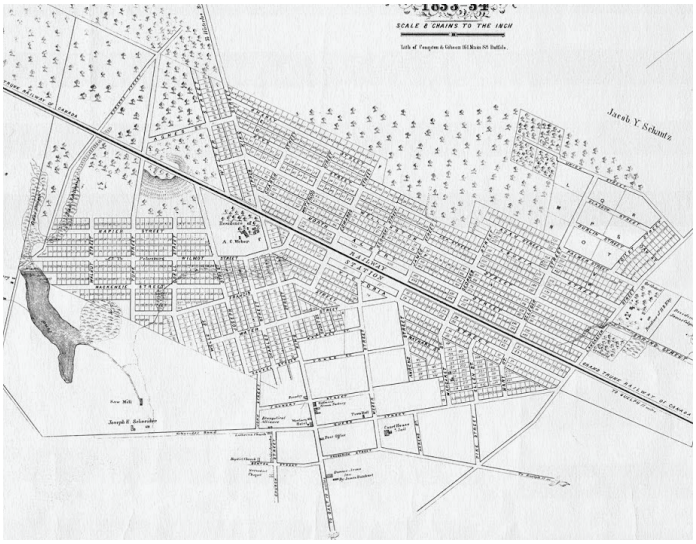
26 "History: Building a world-changer," University of Waterloo, June 17, 2014, , accessed March 22, 2017, https://uwaterloo.ca/about/who-we-are/history.

27 "Fast Facts." City of Kitchener. June 1, 2014. https://www.kitchener.ca/en/businessinkitchener/FastFacts.asp.





1784- Land reserve set aside for Six Nations

1790s- Land sold to first settlers

1833- Township in Waterloo County named Berlin

1853- Berlin earns County Seat

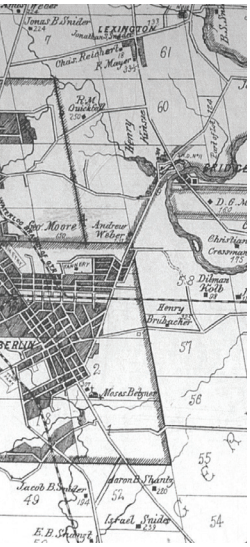
1854- Berlin designated as a town

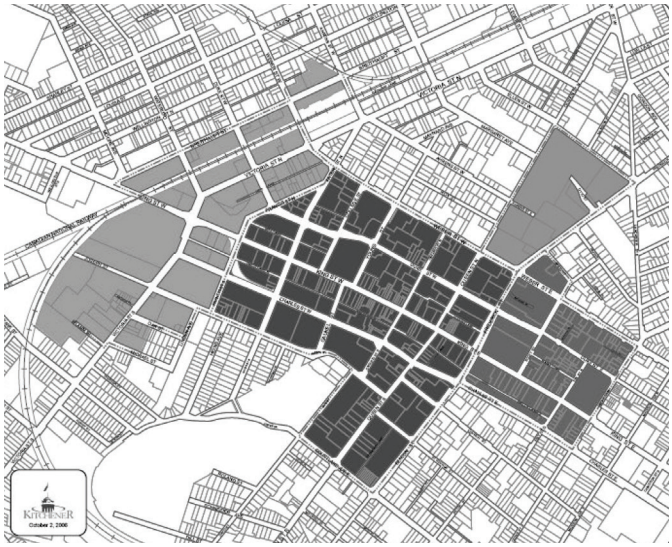
1700

1800

1856- Extension of Grand Trunk Railway built through Berlin

Fig. 2.21 Historical Timeline of Kitchener & Waterloo Region





1912- Berlin designated a city

1916- City changed name to Kitchener

2004- Downtown Kitchener Action Plan

2015- Make It Kitchener Economic Strategy

1900

2000

2011- Waterloo Region LRT plan

Maker Movement as a Counter Culture

Historically, the city of Kitchener was a city of makers, adapting to the culture and industries of their time. Together they formed a highly unique and localized culture that attracted individuals to the region. Through the wars and the industrial revolution, this localized culture was eroded to develop the region's global competitiveness, technology and markets. Since then, many large scale manufacturers have shut down their local plants leaving industrial voids in the city. However, Kitchener is showing promise of an industrial revival through the maker-movement, the re-engagement with the physical world and creation through peer-led, networked, and shared learning.

> *"Cities are finding that the rise of the Maker movement is a transformative moment, one they can seize upon to create jobs and economic opportunities, bring manufacturing back into urban settings, and reshape education and workforce development."*[28]

The reclamation of the former city's name of Berlin in local business and urban form signifies this cultural and urban movement. The practice of making informs the

28 Peter Hirshberg, Dale Dougherty, and Marcia Kadanoff. "Maker City: A Practical Guide for Reinventing Our Cities." *Maker City*. https://makercitybook.com/chapter-1-introduction-c781f7e43524#.qzx6w22ma.

Fig. 2.22 2016 The Berlin Restaurant

Fig. 2.23 2015 Berlin Bicycle Cafe

Fig. 2.24 2015 Berlin Supply Co

development of the city and vice versa which produces a dialectical urban transformation. As a result, there is a re-engagement of the working class and the greater community in the making of the city. With the support of city stakeholders and planners, it creates an urban movement towards what Dale Dougherty identifies as "the Maker City", a community that is resilient in the face of technological change.

> *"What started as a cultural shift— a fascination with new digital prototyping tools and a desire to extend the online phenomenon into real- world impact— is now starting to become an economic shift, too. The Maker Movement is beginning to change the face of industry, as entrepreneurial instincts kick in and hobbies become small companies."*[29]

At the heart of the maker movement is the democratization of access to tools and resources for creative experimentation and practice. While these resources are often thought of as simply the tools and equipment to fabricate material objects, access to urban space is an important asset to consider in the democratization of production. While Kitchener-Waterloo has a significant stock of former industrial buildings, many of the factories have since been

29 Chris Anderson. *Makers: The New Industrial Revolution*. New York: Crown Business, 2012.

transformed into high tech offices and lofts, a change in use that encourages development but it leaves makers with fewer and fewer industrial spaces for their work. This places pressure on urban manufacturing zones to redevelop as offices or residences to extract higher capital returns. Failure to preserve these urban manufacturing zones is a lost opportunity to transform former large industrial factories into small and midscale industrial uses to complement the growing creative, artistic and technical working communities in the high tech sector. There is an opportunity to incorporate the well-established community of makers in the region while also attracting a new sector of the creative class: the designer, craftsmen, artisan, and artist. More specifically, the city has the potential to attract creative professionals from local university and college programs. Urban theorist Richard Florida describes that

> *"Place has replaced the industrial corporation as the key economic and social organizing unit of our time… place-based ecosystems are critical to economic growth."*[30]

By attracting new creative individuals, the city can benefit from the local clustering of engineering, design and

30 Richard L. Florida, *The Rise of the Creative Class: Revisited* (New York, NY: Basic Books, 2012), 188.

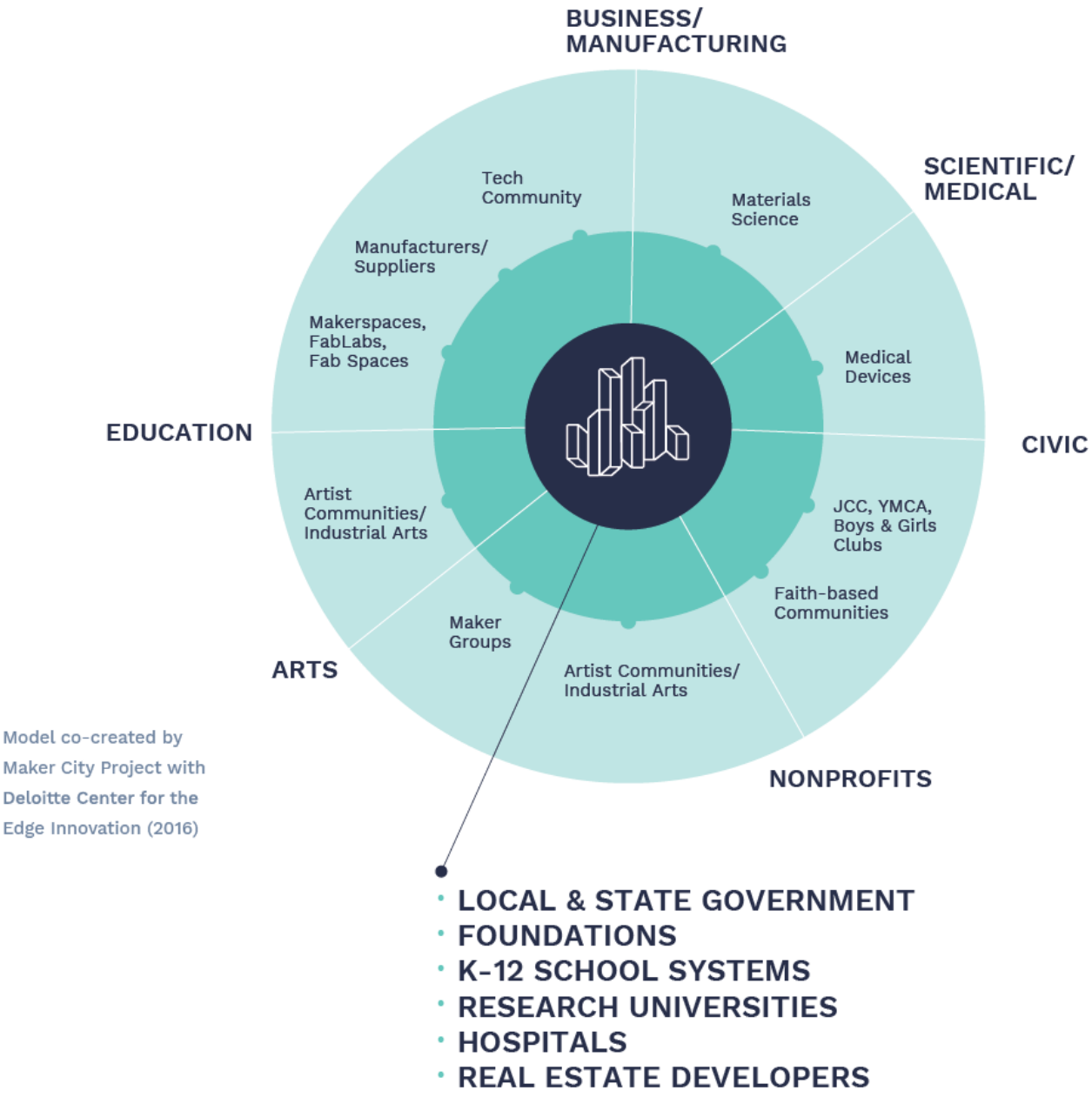


Fig. 2.25 Model Maker Ecosystem by Maker City Project with Deloitte Center for the Edge Innovation

manufacturing sectors in the same geographic place for greater innovating potentials and synergies. The Maker City project by Dale Dougherty recognized this and together with the Deloitte Center for the Edge Innovation mapped a model of the maker city ecosystem. The ecosystem is comprised of three concentric circles showing how public and private organizations can engage and be part of a larger network. the outer circle includes technology, arts, maker and creative community groups. The inner circle includes community, cultural and educational institutions. At the centre lies government, business corporations and research institutions. The creation of an ecosystem requires organizations across all levels to get involved, form 'clusters' or concentrations of these stakeholders groups, and build a cohesive strategy in developing the urban region together.

> *"The potential advantages of clusters in perceiving both the need and the opportunity for innovation are significant, but of equal importance can be the flexibility and capacity to act on them quickly."*[31]

31 Michael E. Porter, "Location, Competition, And Economic Development: Local Clusters In A Global Economy," *Economic Development Quarterly* 14, no. 1 (February 1, 2000): 24.

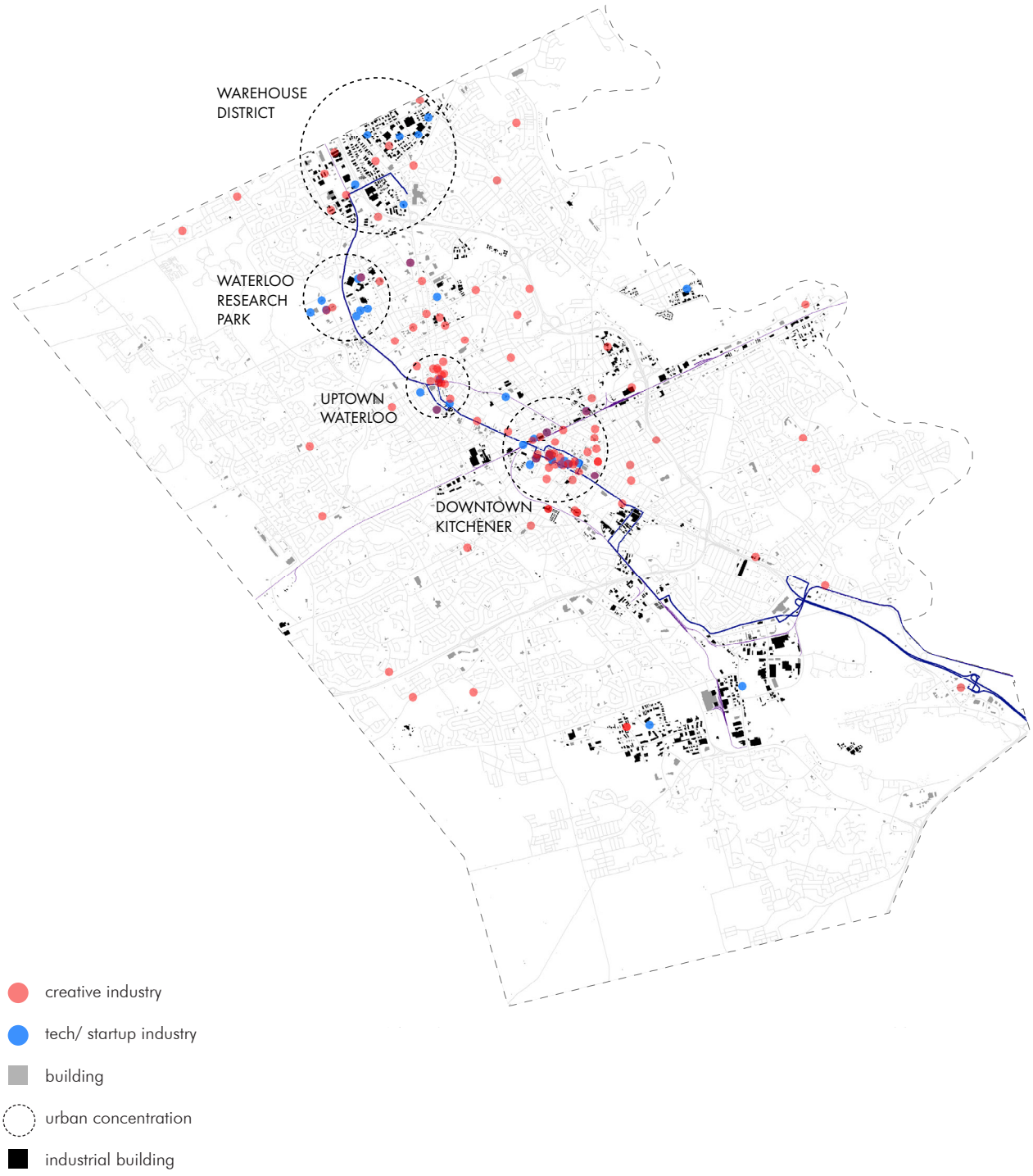


Fig. 2.26 Creative and Technology Clusters in Kitchener-Waterloo

The importance of the ecosystem in working together is in their collective ability to understand, perceive, adapt and/or react to the current and future challenges in their community. Connectivity is essential in growing these bottom-up communities into more than a sum of its parts and into a network that can be a catalyst for urban transformation. Understanding how clusters are emerging presents an opportunity for various stakeholders to build from these existing growth conditions. A geographic information system(GIS) was used to map a localized list of creative and technology organizations to understand their tendencies to develop along key urban areas within Kitchener-Waterloo. While the list is not exhaustive, it does begin to capture the clustering of industries in existing downtown centres as well as emerging areas of vacant and industrial sites. "This dual process of the personalised local with the digitised global has the potential to breathe some new life into the 'ghost towns' that have been impoverished by industrial collapse."[32] By encouraging the developments of a localized maker and creative industry while also tapping into the provincial network of innovation,

32 Mark Richardson, Susie Elliot, and Brad Haylock. "This Home Is a Factory: Implications of the Maker Movement on Urban Environments." *Craft Plus Design Enquiry* 6 (January 2013): 141-53.

Film & Recording

Arc Media
Barndoor Creative
Blue Lizard Productions Inc.
Bruzen Vi Gada Productions
Busy Brain Media
C to C Productions
Christie Digital
Dragongem Productions
Esteem Media Productions
Finscot Films
George Briggs
Hey Cadet Films, Inc.
High Rise Studios
Huckleberry Films
Innertainment Media
Media House Moving Images
Memory Tree Productions
MetaMedia Productions
Rosco Films
Skylight Productions

Busted Flat Records
Fauxtown Records
SM Recording
Small Dog Studio
Studio A
The Sound Distillery

Music, Theatre, Arts

ActOUT KW
Beckett School Inc.
Black Walnut Folk Club
Centre In The Square
Chestnut Hall Camerata
Chestnut Hall Music
DaCapo Chamber Choir
Grand Mastering
Grand Philharmonic Choir
Grand River Jazz Society
Green Light Arts
Inter-Mennonite Children's Choir
Kitchener Blues Community Inc.
Kitchener Waterloo Art Gallery
Kitchener Waterloo Little Theatre
Kitchener Waterloo Symphony
K-W Musical Productions
Lost & Found Theatre
Maxwell's Concerts and Events
Menno Singers
MT Space
Neruda Arts
Nota Bene Baroque
NUMUS
Old Chestnuts Song Circle
Pat the Dog
Southwestern Ontario Suzuki Institute
Stratford Symphony Orchestra
The Boathouse
The Button Factory
The Gilbert & Sullivan Society - W'loo
Reg Branch
The Grand River Folk Community
The Jazz Room
Kitchener-Waterloo Chamber Music Society
Kitchener-Waterloo Community Orchestra
The Registry Theatre
The Renaissance Singers
The School of Rock
The Waterloo Concert Band
THEMUSEUM
Rhapsody Barrel Bar

Architecture Interior Design

Robert J. Dyck, Architect & Engineer Incorporated
David Thompson Architect Limited
Simone S. Panziera, Architect
WalterFedy
MJ Architecture Ltd.
Carole Boucher Architect
John Macdonald Architect
Robertson Simmons Architects
SRM Architects
AECOM Canada Architects
John Clinckett Architect
William J. Krohn Architect
MMMC Architects
ABA Architects
Facet Design Studio
Studio M
Masri O
Stantec Architecture
PG Design Studio
IBI Group Architects
Whiting Design
Dfy Studio
Head Turner Designs
Karen Wilson Interior Design
Designs by Amanda
Decorators Corner MJB Design Inc.
Gardy Interior Design
Elemental Interior Design
Slotegraaf

Fig. 2.27 List of Creative and Technology Companies Kitchener-Waterloo

Digital Media

Clean Slate Studios
Danipa
Digital North Media Inc.
Digital Shift Corporation
eSolutions
Halfull Design Solutions
Him and Her
Hyper Text Digital Publishing
Montana Publishing
Painted Pixel Studio
Pixweaver Inc.
QT Web Designs
REM Web Solutions
Skiva Multimedia
Stryve Group
Stylex Media Design Inc.
The Incognito Group
Tilted Pixel Inc.
Two Blonde Chicks Inc.
Waxworks Creative
Z Factor
Arrowsmith Corporation
Brighthouse Branding Group
Crankworks Creative Inc.
ENVionX
Eyelight Inc.
Hagon Design Inc.
Isabel Avery & Company
Mad Hatter Technology
Quarry

Gaming

Boom Digital Media Group
Lunarch Studios
Deep Realities
Digital Wizards (Neq Media)
EA Mobile
Industry Corp
InfiniDy
Norbsoft Canada

Tech / Startups

Balute
Blitzen
Chalk.com
Charity Republic
Coins-e
Kik
Linkett
Maluuba
MappedIn
MetricWire
Reebee
Thalmic Labs
Vidyard
Auvik
Aeryon Labs
Opentext
Aprivacy
Axonify
BlueRover
Bonfire Interactive
Boom Digital Media Group
Changeit
Clearpath Robotics
Client Outlook
CrossChasm
Dyverga Energy Corporation
Energent
Enflick
Eyedro Green Solutions
InfinidyIntellijoint
Karos Health
LoyaltyMatch
Magnet Forensics
Mespere Life Sciences
Miovision
Nicoya Lifesciences
Plasticity Labs
Plum
Primal Beta
Renomii
Sober Steering
Sortable
Spark Matrix
Sweet Tooth
Tangam

the region can transform its industrial roots into a new era of innovative production in the global economy.

The list of creative organizations was largely generated from the Creative Content Industry in Waterloo Region report prepared by FAD Research Inc. for Creative Enterprise Initiative in May 2015.

The list of technology companies were provided by Velocity and generated from the Accelerator Centre and Communitech website.

Regional and City Urban Planning

As Kitchener-Waterloo shifts towards a more technology focused economy, the region has developed partnerships with neighbouring cities to encourage economic development across the southwestern Ontario corridor. The cities of Toronto, Brampton, Guelph, Kitchener and Waterloo have been branded as the Innovation Corridor, a technology supercluster with the aims to rival Silicon Valley.[33] These cities are home to over 15,000 companies, 200,000 technology workers and 5,200 startups.[34] To strengthen this connection, the cities have made it a major priority to encourage the development of transportation infrastructure to increase accessibility and to spread intercommunity collaboration. Each city brings local advantages because of the cluster of their particular industries. While the inherent goal is to bridge these cities into a cohesive corridor, each city is growing as independent nodes. Most notably are Kitchener-Waterloo and Toronto, at opposing ends of the corridor. Encouraging the connections across the corridor is imperative for the cities to continue to share and build off each locations particular

33 Pat Lynch. "Why Toronto and Waterloo Are Hooking Up." Huffington Post. November 30, 2013. http://www.huffingtonpost.ca/pat-d-lynch/live-work-cluster_b_4360995.html.

34 "112km of Innovation." Thecorridor.ca. https://thecorridor.ca/.

Fig. 2.28 Centre for Social Innovation on Bathurst

strengths to form the supercluster that is envisioned.

Connectivity is particularly important in the bottom up communities where the building of local networks and organizations that they can both learn from and collaborate is imperative for their growth and sustainability in a fast changing urban environment. Building the connection between cities can help organizations learn from new spaces of production that are being developed in other cities. Local makerspaces, coworking spaces and incubation spaces can learn best practices and the many challenges faced in more mature organizations in other regions.


BRAMPTON/MISSISSAUGA
20 startups
250 high-tech companies
GUELPH
510 startups
150 high-tech companies
KITCHENER-WATERLOO
1000 startups
1300 high-tech companies
401
8

Fig. 2.29 Toronto Waterloo Corridor

The Growth of the Design Community

Fig. 2.30 CIGI Campus 2014 Governor's General Medal

Despite Kitchener-Waterloo's reputation as an industrial focused city, the region does have a strong history in design as well as growing community of workers in the creative sector. However, the region has been unable to capture the full potential of the design community because of its inability to attract, encourage and retain these creative individuals in the region.

Architecturally, the region has a strong design presence which is well noted in its many award winning architectural buildings. As a medium sized city, it has the most Governor's General awards, the highest honour for architectural projects in the country, outside of the three major metropolitan cities in Canada; Toronto, Vancouver,

and Montreal.[35] However, the city is not defined by iconic cultural projects, but rather a regional architecture that has been influenced by the industrial vernacular architectural landscape. The opportunity to promote a local architectural design culture is in the transformation of the smaller scale urban fabric that developed by individual community participants. In order to attract creative architectural designers, the clients that make up the market must also push the boundaries and demand a higher level of design. Through this collective movement, Kitchener-Waterloo can begin to redefine itself as city that encourages art, design and industry as a cohesive force.

From the planning level, many events have been encouraged to provide a platform for artists, makers, and designers to interact and engage with the local community. Events led and driven by the artists and designers themselves have proven to be the most successful in terms of continued organization and yearly growth. Partnerships with local actors, city governments and the community must continue to be formed to build a creative culture in the city.

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35 "Governor General's Medals in Architecture — Past Recipients." RAIC | IRAC Architecture Canada. https://www.raic.org/raic/governor-generals-medals-architecture-—-past-recipients.

Fig. 2.31 NightShift Placehacking Festival

Night/Shift is an arts and performance festival that was launched in 2013 by Eric Rumble as a marketing experiment for Alternatives Journal.[36] The festival has since been occurring annually, attracting thousands of people to explore the city at night through the participation of community arts. Night/Shift is an example of experimental design that achieve a greater level of permanence through community and city level support.

> *"The festival enlists both artists and citizens from various subcultures to experience reanimated pockets of their built environment, share rare communal experiences, and spark unexpected collaborations."*

Fluxible started in 2012 as a two-day user experience and

36 "NightShift." NightShift. http://nightshiftwr.ca.

Fig. 2.32 Fluxible UX Conference

design conference that has since expanded to a week-long series of speaker, workshop and meetup events.[37] The conference brings a global presence to the city and encourages the discourse of design and user experience in the technology and startup ecosystem.

The first maker festival in Kitchener-Waterloo was organized in 2013 as the Waterloo Mini Maker Faire. In 2015, the maker festival was rebranded as the Maker Expo showcasing over 100 local makers and attracting over 7500 visitors.[38] The continued growth of the Maker

37 "About Fluxible." Fluxible Canada's UX Festival. ttp://www.fluxible.ca/wp-content/uploads/2016/03/Fluxible2016-Sponsorships.pdf.

38 "Maker Expo 2015." Maker Expo. http://www.makerexpo.ca/past-expos/maker-expo-2015/.

Fig. 2.33 MakerExpo Kitchener

Expo shows the growing presence of makers and making in the region.

The emergence of art, design and maker events and festivals in the last five years in the region is an attempt to fill a local need to grow these creative communities. Their success and the continued presence of such events shows a changing community demographic and interest in these creative fields. However, without a platform to continue the discourse of design beyond these isolated events, the region cannot continue to build the momentum to encourage and grow the design community beyond the spectacle. As a result, many creative communities have emerged as informal groups that have organized through social media networks.

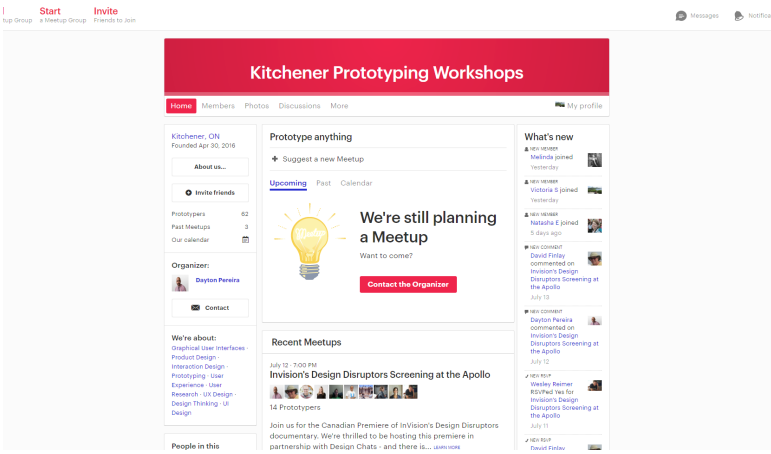

Fig. 2.34 Kitchener Prototyping Workshops Meetup

The design community in particular has emerged and grown through online channels to fill the need for greater connection, collaboration, and discourse in user experience, interface, product and other aspects of design. Using social media platforms such as Facebook, Slack, and Meetup or personal websites, these design communities are collectively organizing online and meeting offline at various venues in the city. For example, the DesignChats community began as a breakfast series between a couple of designers at different local technology companies and has since grown through their blog and continued event series.

Artist, designer and maker communities are growing in Kitchener-Waterloo and are collectively organizing events

Fig. 2.35 Brew Over Design

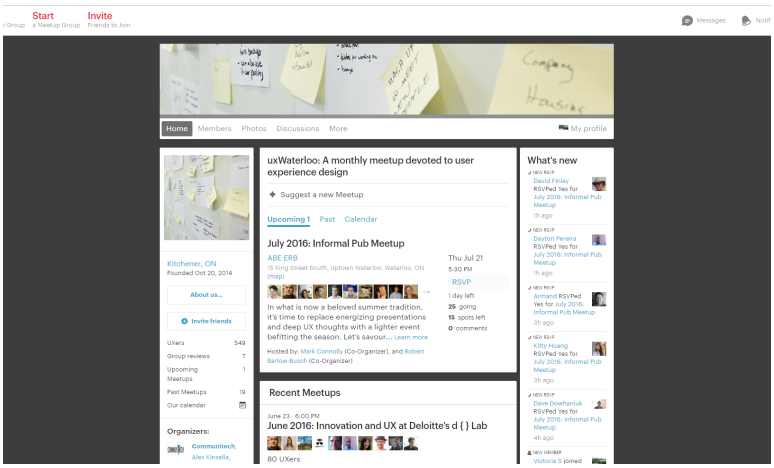

Fig. 2.36 UxWaterloo Meetup

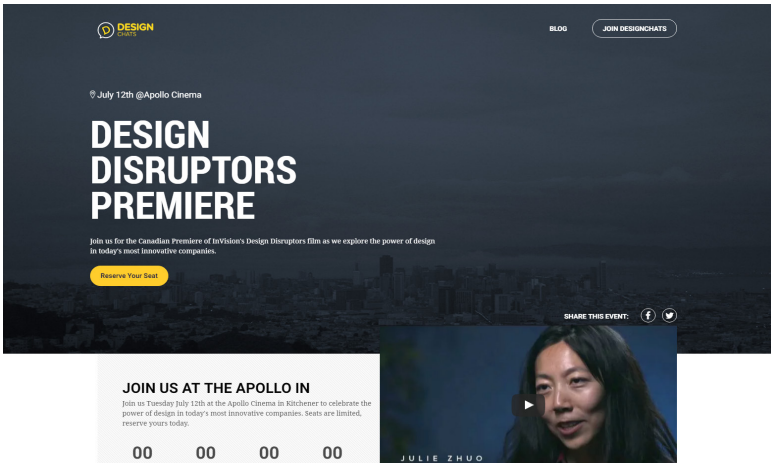

Fig. 2.37 DesignChats

and meetups to fulfill a need that has not yet been developed in the city. While these design groups are continuing to grow, they are still in the early stages of community development. As designers are isolated in larger corporate organizations, they are driven to collaborate and learn from other professionals in the field. Therefore, the growth of a local design community has been sparked by the technology sector and the increasing value companies see in the creative sector economically. While these events are important for community growth, they are also limited to the access and use of facilities depending on temporary agreements with property owners. Community growth is reliant on the continued partnership between private enterprise and community groups and as such must negotiate the use of space based on the objectives of both parties. However, as property owners, they ultimately have control over the means in which communities can use their space. Therefore, communities precariously exist within the city until they can access a space of their own. While precarity isn't an issue in the fostering of temporary connections, it has limited potential in developing the deeper relationships that promote collaboration and organization towards productive value.

Opportunities in Industrial Sites

Cities undergoing de-industrialization have left factories, warehouses, brownfield and vacant sites available space for redevelopment but these districts are often overlooked by commercial markets because these spaces pose challenges in turning a quick profit. While these spaces lack the exchange value to trade on the market for economic returns, they do provide alternative spaces for creative uses and people to operate in an often otherwise unaffordable real estate market. This is an important consideration in terms of urban planning to support development in all areas of the city, including sites that are not invested in due to lower investment potential,

> *"Today, the only parts of a city developed according to plan are investment-relevant locations expected to yield correspondingly high returns... In terms of the city landscape this manifests as island-urbanism. Projects at commercially interesting sites are completed in line with a masterplan. Investors ignore unprofitable districts and areas that cannot be marketed in the short to medium term"*[39]

While investors are important agents in developing the city, other community actors should be encouraged to develop spaces for their community needs. Only through active

39 Klaus Overmeyer, ed. Urban Pioneers: Temporary Use and Urban Development in Berlin. Berlin: Jovis, 2007,103.

Fig. 2.38 Electrohome Building

Fig. 2.39 Rumpel Felt Factory

Fig. 2.40 Joseph Street Smokestack

participation in a variety of groups can the city be built to ensure a diversity of needs are included and advocated for. While these individuals may lack the economic resources in highly sought after areas, vacant and industrial sites provide an opportunity to realize values outside of the capitalist system. These spaces are considered "unreal estate", property that has decreased in exchange value to the point in which it can assume use values unrecognized by the market economy.[40] Therefore, unreal estate can re-engage community participation in city building where market forces are driving the development process. Using vacant spaces as opportunities to experiment with temporary uses, these sites can generate community resources that are void or lacking in the city. While these community uses, such as event or cultural venues may be provided by the city in some ways, their inability to adapt to local needs may leave them ill-suited for the community they aim to provide for. Grassroots communities generated through temporary use sites can adapt and innovate much faster to address community needs. As a result, as these organizations grow into permanence they will have already iterated the design, programming, and operations to a level of understanding

40 Andrew Herscher. The Unreal Estate Guide to Detroit. Ann Arbor: University of Michigan Press, 2012.

that is more sustainable in the city. Therefore, to support the use of vacant spaces, adaptation of industrial sites and temporary use is to support the innovation of space, community building and placemaking.

> *"Vacant sites and disused premises are not a constraint but a prerequisite of restructuring. They are the spaces of the future: a training ground and experimental zone for the future city. They are a part of this city's wealth."* [41]

41 Ibid,18.

Currently, Kitchener-Waterloo region has several industrial areas that have redevelopment potential for creative uses but there are barriers that slow this progress. Makers, designers, artists and hardware startups all face similar challenges in establishing their business practice:

1. **small industrial space uses-** existing factories are often too large to be financially feasible for a single occupant use while many of the accessible rentable spaces are not zoned to allow for industrial or light manufacturing uses.
2. **transportation access-** typically industrial spaces are situated on the peripheries rather than in the city resulting in transportation access becoming an additional hurdle and cost.
3. **isolated industrial zoning-** industrial zones are typically isolated from the rest of the city to prevent exposure to noxious chemicals, fumes, associated with heavy industry. However, this also prevents industrial uses from being integrated into mixed use communities.
4. **investment in business over real estate-** smaller companies have lower capital reserves and tend to invest into materials, tools and equipment

over facilities making them vulnerable to rent increases

5. **cost of equipment-** industrial scale machinery and equipment may be too expensive for small scale manufacturers to purchase and may require the pooling of resources amongst community groups to purchase.
6. **batch production vs mass production-** moving from a small scale of production, batch production, to mass production is a financial and design hurdle in terms of prototyping and scaling the business.
7. **traditional industries have less access to funding-** industries in the arts and crafts have cultural and social value to the local community but many funding programs are focused on business and the generation of economic value.

If the city can lower these barriers, these areas will not only attract creative professionals but also a diversity in spatial programming to encourage mixed use community development. Urban planners and architects can act as mediators between the city and the community in the facilitation and activation of vacant sites for temporary use.

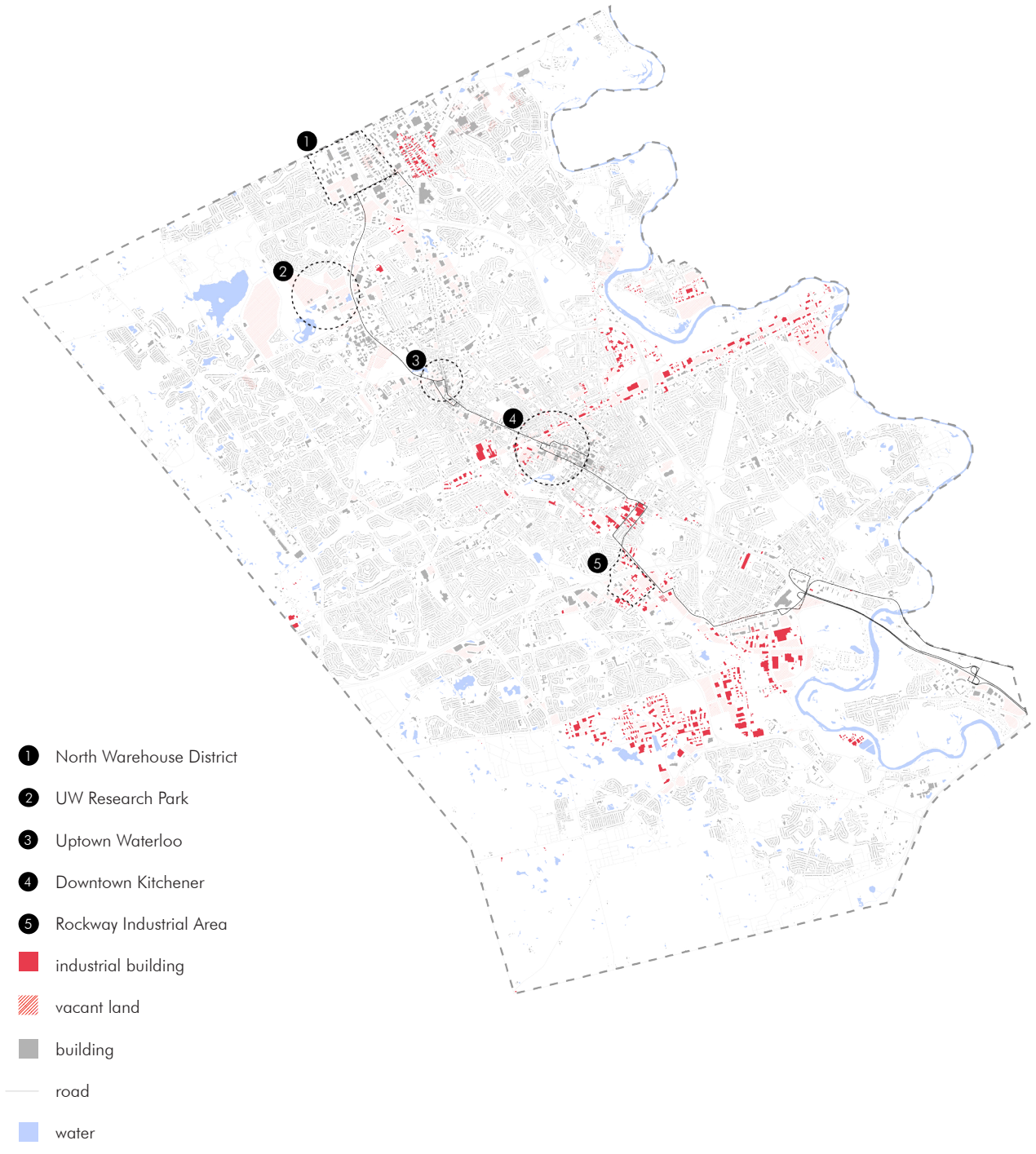

Fig. 2.41 Vacant and Industrial Sites in Kitchener-Waterloo

"Finding the right place is a question of recognizing a site's potential. It isn't the current state of a place that's decisive but, rather, how inspiring it is. The original idea is considerably modified by the place one finds. The location is the sum of the local environment, the available spaces and their atmosphere, the objects found at the place and those owned by the temporary user, as well as the owner, the local residents and everything else that is somehow connected to the place…. It's about adapting an idea to a certain place (and vice versa)- until that moment when the idea and the place become one and something new has been created."[42]

By connecting local actors with vacant spaces for temporary uses, architects and planners can promote the city and its spatial assets as a laboratory for innovation. Not only is this important in revitalizing neighbourhoods but also in the preservation of industrial heritage and its cultural significance in building the region today. It is only fitting for the makers, the individuals that grew the region, to reclaim these spaces into a new wave of production in the city. The following chapter is an exploration into the maker community in Kitchener-Waterloo and its connection to Toronto's creative community. The stories of these makers, artists, creatives and organizations began to inform the spaces in which they embedded their communities.

42 Ibid, 45.

Fig. 2.42 Creative Spaces and Resources in Kitchener-Waterloo

CHAPTER 3:

EMERGING SPACES OF PRODUCTION

Journey into the Maker Community

My journey into the maker community in Kitchener-Waterloo began after I graduated from the University of Waterloo School of Architecture in 2014 and I wanted to continue learning through making and to improve my architectural and entrepreneurial skills through a hands-on experience. After being in the classroom and working in architectural offices for five years, I wanted to build something of my own. At the same time, having been exposed to the growing entrepreneurial community in Waterloo I was curious to see how this translated to the design community in the region. So, I decided to move to Kitchener and try to understand the city and region as an architect, an entrepreneur, a maker and member of the local community.

After several months, I purchased a small century home in the city where I began to fully renovate the home myself from demolition, to electrical, to drywall to flooring. However, being the first time performing many of these tasks there were many challenges along the way from learning the right tools and techniques to achieve a certain look to learning about codes and permits. As much as I could read books or watch video tutorials online I found that as I faced some of these challenges I wished there

Fig. 3.1 Renovation of Personal Kitchener Residence

were individuals I could ask questions to or help in the processing of finding a solution. In the journey to create something of my own I began searching for a community in which I could learn and grow with. More importantly, I wanted to discover what an architect can provide to a local ecosystem with a strong culture in both technology and the arts? I spoke to a variety of individuals and organizations to learn how they started, the purpose to their mission, what they did differently that made them successful and the takeaways other individuals in the creative industry could apply to their practice. The dates of these site visits and interviews are referenced at the beginning of each section. Through their stories, I sought to derive a process from which they took an idea, formed an organization and embedded themselves in the urban ecosystem.

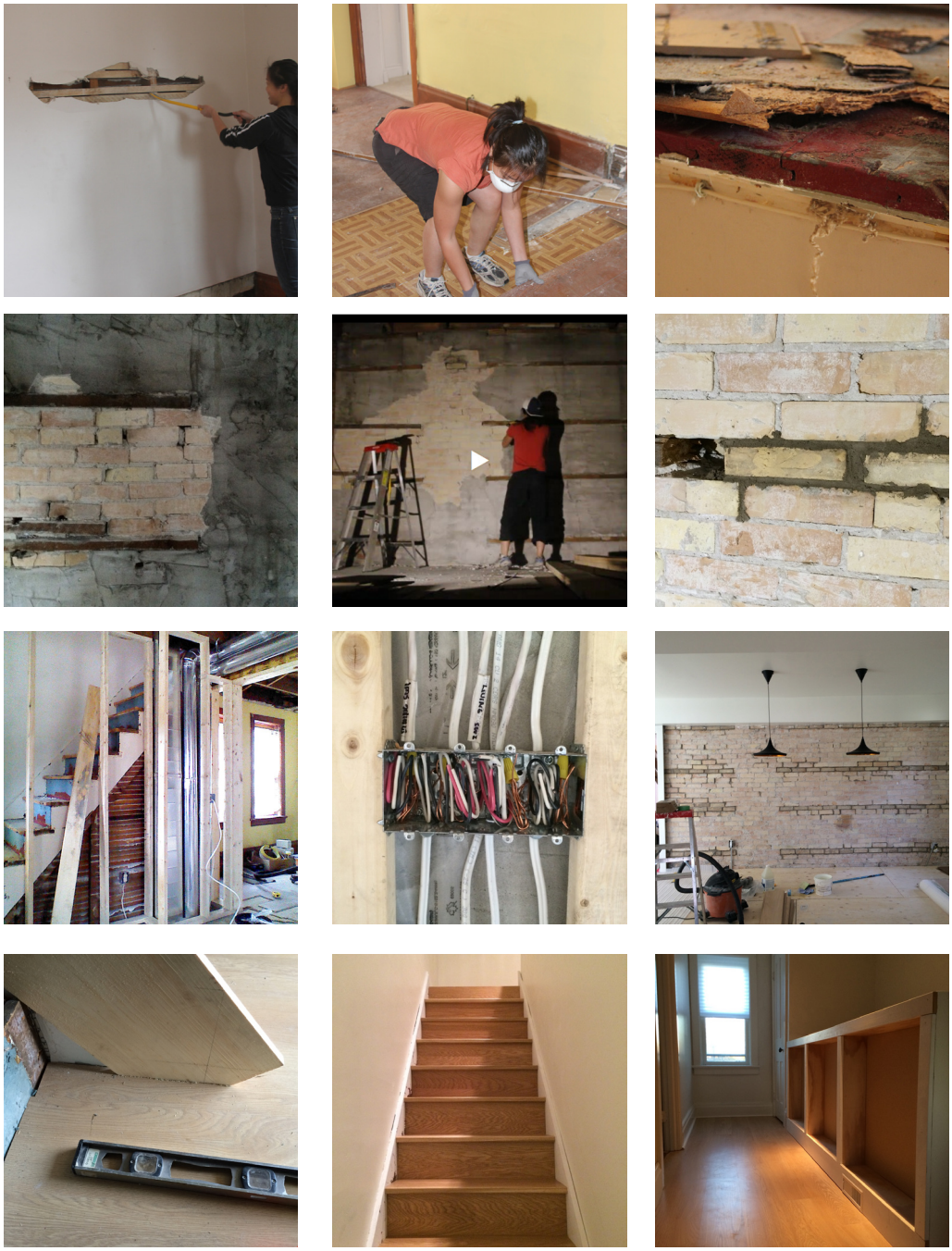

Fig. 3.2 Kitchener Residence Renovation Process

Hacksmith Industries

Reference Date: March 2015-

I first met the founder of Hacksmith Industries at a hackathon event. This hackathon in particular was a competition in which individuals with various backgrounds and skills in technology, design, and business formed into teams to work together for 48 hours over the weekend. Each team identified a problem they wanted to tackle and together came up with a solution, prototype and pitch. In developing our prototype, we were introduced to Hacksmith Industries which operated on a residential lot down the street from my house. However, this lot was peculiar in that it sloped downwards toward a former rail line and had a two storey industrial garage grandfathered into the site.

The workshop included a variety of power tools, a laser cutter and various parts and equipment purchased from garage sales or salvaged locally. The founder was working at a local technology company but was looking to transition towards a full-time career focused on producing various creative projects and developing videos on Youtube. In the meantime, the house on the front of the lot was partially rented out while the founder also worked to financially sustain themselves until the business grew.

Fig. 3.3 Hacksmith Industries Building

Taking advantage of a peculiar site that could act as a place for home and work proved advantageous and also provided an opportunity to rent out part of their home for additional income. Since then, the founder has successfully transitioned to work on their creative enterprise full-time.

Key Takeaway

- Residential and industrial mixed use lots provide makers with live/work space and possibility to subsidize or share living costs with other creative individuals

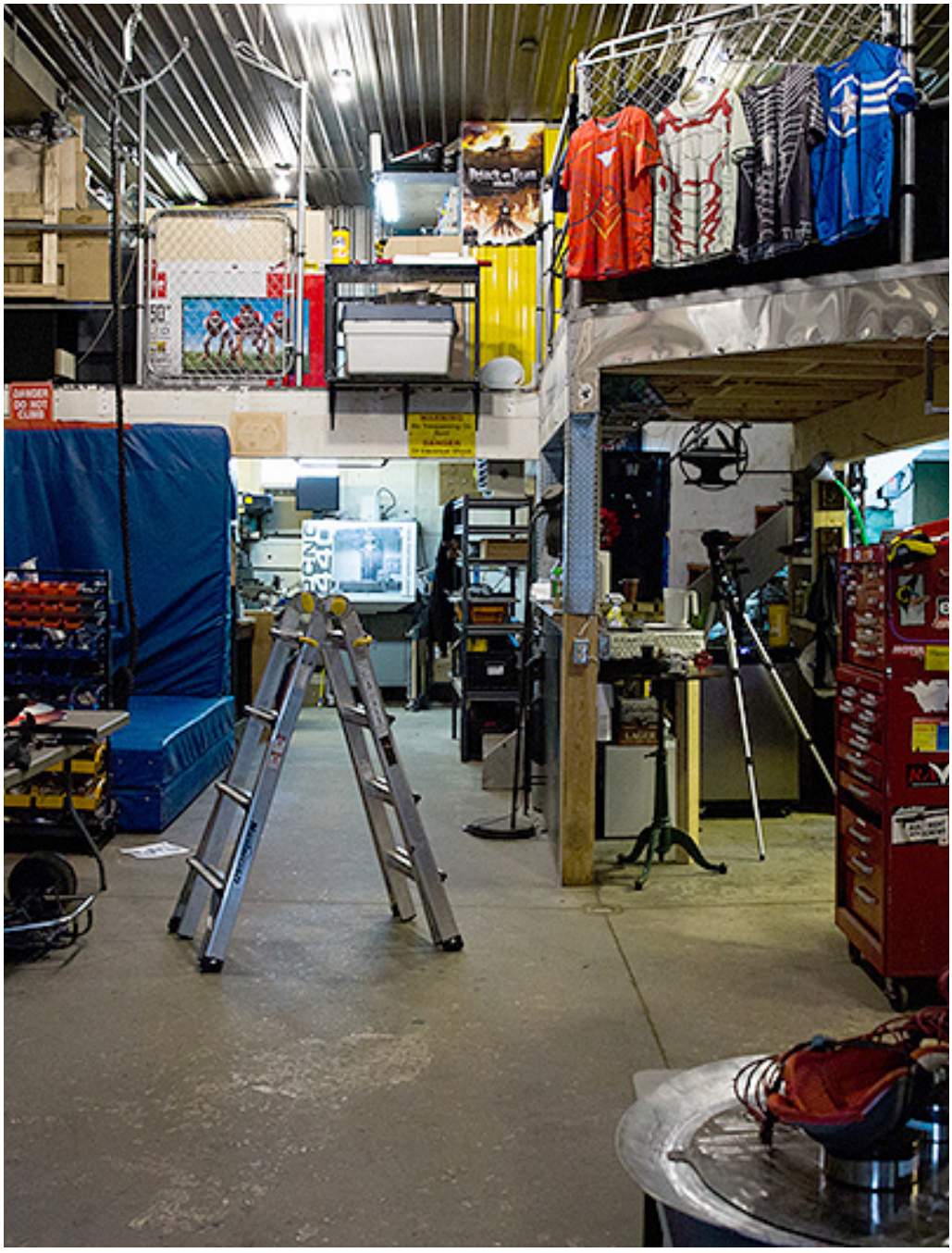

Fig. 3.4 Hacksmith Industries Interior

Boko

Reference Date: April 22, 2016

Boko is a design collective based in Wellesley, Ontario that was founded by a fellow colleague that I met at the Waterloo School of Architecture. It began as a means to explore different aspects of making, design and building outside of traditional commercially focused practices. After considering pursuing a graduate degree in architecture, the founder decided to develop a community of people with complimentary skillsets to collaborate with on different projects while each individual could still pursue their personal craft. Located in a warehouse formerly used for storage, they have since added a washroom, glazing on the garage door to increase natural light and an enclosed office. The space includes a front open office area with a back workshop comprising of mostly woodworking tools. Compared to other hackerspaces I visited, I noticed a considerable attention to detail in terms of organization of the space, tools, equipment and parts.

Founded in 2014, Boko has been operating for over three years in its current industrial studio. They have considered moving closer to the city in nearby industrial neighborhoods but higher rents made these spaces financially unviable.

Fig. 3.5 Boko Building

Asked if they ever considered joining existing hacker or maker spaces to access equipment or to meet potential collaborators, they responded that the local spaces mostly attract hobbyists looking to tinker with different equipment as opposed to working on completing full projects. They also tended to have a different focus on robotics and electronics as opposed to furniture and craft. Boko's portfolio of projects include a commission to build a tiny house, various installations and custom furniture pieces for local cafes, restaurants and technology companies. Boko's long term plans include building out their workshop and possibly working on a larger variety of projects to expand their skills.

Key Takeaway

- Warehouse conversions to creative workshops
- Renting space to other freelancers or small businesses to help with rent
- To attract different types of industries, communities require a multiplicity of hacker or maker spaces to cater to specific needs

Fig. 3.6 Boko Interior

KwartzLab

Reference Date: May 24, 2016

After discussing local hackerspaces and makerspaces with Boko they mentioned I should make a visit to KwartzLab in Kitchener. I visited on one of their open nights where they welcome the community to visit and work on projects of their own. Located on an unconventional industrial lot in a residential neighbourhood, KwartzLab called a small warehouse space home. It had a shotgun style floorplan with a front open work space, followed by a digital fabrication room which housed a laser cutter and several 3D printers and finally a workshop at the back with both woodworking and metalworking equipment. There is also a second floor which had space to work with electronics, arduinos, sewing and embroidery tools and a small lounge and kitchen area. Speaking to some of the members there, many were working on robotics and engineering focused projects which primarily investigated the mechanics of how things work by repurposing or 'hacking' things together.

Kwartzlab began as a group of hobbyists, many of whom worked at Blackberry at the time, who wanted a space to collectively work and tinker with new technologies. The founder put out a call for people interested in forming

Fig. 3.7 KwartzLab Building

a hackerspace on his website. They began conducting meetups at various places in the community to run workshops on electronics, arduinos, robotics, and more. As the group got bigger and the demand for larger equipment grew, they sought out a more permanent space to work. As a result, a more formalized organization was needed to set up such a space and the group began looking at existing models of hackerspaces in Toronto. Members who were most interested in moving the organization forward formed a steering committee and travelled to Toronto's Hacklab space to learn more about how they operate. Soon after, Kwartzlab signed over twenty members collecting $3000 in preliminary funds to incorporate and sign a lease for their first location. Initially, Kwartzlab was located at the Boehmer Box factory on 283 Duke Street in Kitchener but eventually moved into a small industrial building on Kent Avenue. The industrial building sits on an irregular triangular shaped lot in a primarily residential neighbourhood. The building doesn't conform to current zoning and setbacks which limits its use to its current footprint otherwise requiring expensive rezoning or permits. While a small lot and building footprint may deter larger businesses away, such a condition in the urban fabric provides an opportunity for emerging organizations to situate themselves in accessible

Fig. 3.8 KwartzLab Interior

areas in the city. Operating since 2009, Kwartzlab has successfully sustained itself through a low membership fee model and procuring new equipment from member or business donations.

Key Takeaway

- Establish a steering committee to aid in decision making process and accountability towards getting things done
- Preserve small industrial lots to provide opportunities for start-up maker organizations to utilize accessible space in the city

Fig. 3.9 KwartzLab Community Night

HackLab.TO

Reference Date: June 21, 2016

I visited HackLab on a Tuesday, an evening where they open up the space to the community in what they describe as an open hack night. As I walked toward the building on Queen Street in Toronto, there was a small sign on the sidewalk that indicated HackLab Toronto was just around the corner. I was buzzed in and made my way up a flight of stairs, around the corner and arrived at their unit at the end of the hall. When I arrived it was a little early with only a few members at the workstations and a couple of people in the kitchen. They were preparing snacks and a light meal as a way to bring people together before they returned to whatever projects they were working on. They gave me a tour of their space which included a small workshop with various wood and metalworking tools, open desk space, a science lab, kitchen, a lounge workspace in the back and a sound recording room. I asked various members about the projects they were working on or have worked on in the past and they showed me some of their 3D printing experiments, a can crusher and a digital sign. The eclectic mix of hobbyists and people showed their real passion in tinkering with different types of tools and equipment for fun.

Fig. 3.10 HackLab Building

Hacklab is a non-profit hackerspace which started with three people meeting in a living room every Tuesday to work on projects together. [1] In 2008, they made their organization official by signing a lease for a 600 square foot space in Kensington market growing to a membership base of around 35 in a couple of years.[2] They launched a crowdfunding campaign in 2013 and raised $4000 to move to an 1800 square foot space next door. [3] The following year they moved to their current location on Queen Street West and growing to roughly 60 members. Hacklab is made up of a diverse community of artists, computer programmers, web designers and hardware hackers.

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1 Deborah Hernandez, "New tech space HackLab.TO prepares to welcome public | Metro Toronto," Metro, April 10, 2015, http://www.metronews.ca/news/toronto/2015/04/10/new-tech-space-hacklab-to-prepares-to-welcome-public.html.

2 Denise Balkissoon, "Hackers: Not Just Geeks, but Activists," Thestar.com, April 06, 2010, https://www.thestar.com/news/gta/2010/04/06/hackers_not_just_geeks_but_activists.html.

3 Matthew Miller, "Hacklab.to is Moving," Indiegogo, September 06, 2013, https://www.indiegogo.com/projects/hacklab-to-is-moving#/.

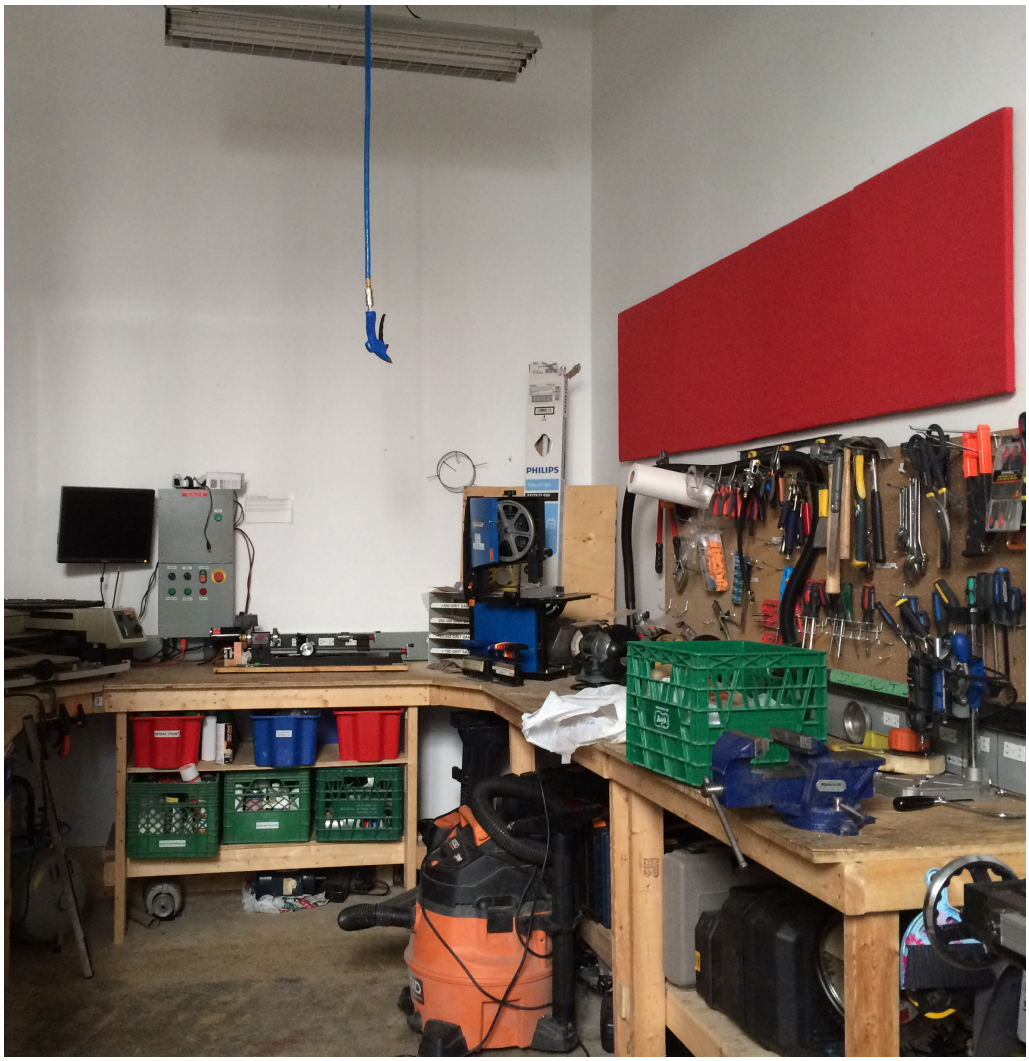

Fig. 3.11 HackLab Workshop

Key Takeaway

- Smaller cities can build relationships with Toronto's more mature creative community which includes 9 hackerspaces, 16 coworking spaces and many more creative organizations to learn from and potentially replicate various aspects of their organizational and operating models

Fig. 3.12 HackLab Rear Workspace

Hot Pop Factory

Reference Date: June 21, 2016

Out of the Hacklab space emerged Site 3 Colaboratory, a makerspace off Ossington Street. After experiencing the Hacklab space in Kensington, a former member realized they needed more space to fabricate and chose to start their own space with a full machine shop.[4] Site 3 caters to people in the arts and technology sector with a greater focus on fabrication and the ability to work on larger projects or installations. Site 3 is where Hot Pop Factory, a design company specializing in digital fabrication and customized manufacturing, worked for many years before launching into their own space.

Hot Pop Factory was founded by two University of Waterloo architecture grads after experimenting with digital prototyping and form finding. They begin 3d printing jewellery by using local makerspaces and purchasing inexpensive 3D printers of their own. Their business was doing well so they decided to continue growing the company instead of pursuing post graduate studies. As 3D

4 Balkissoon, Denise. "Toronto Makers and Hackers Share a Philosophy on Tools." The Globe and Mail. March 15, 2013. http://www.theglobeandmail.com/news/toronto/toronto-makers-and-hackers-share-a-philosophy-on-tools/article9837168/.

Fig. 3.13 Site 3 Makerspace Building

printing was gaining popularity at the time, they garnered a lot of media attention and the technology aspect of their business also gave them access to resources at MaRs, a Toronto innovation hub that provides a variety of venture services. Eventually their business grew to a point in which the number of purchase orders they received required their own space with dedicated workspace, more storage, and reliable and timely access to equipment. They managed to secure their own office in the basement of the Robertson building, the home for a community of creative businesses, social entrepreneurs, and non-profit organizations. Though cited as a creative community, the downtown location is still comparatively more expensive but having closer access to their design clients was deemed essential to their business. They have since transitioned to focus more on design projects for other businesses and brands and also see the opportunity to expand into a mid-scale producer helping smaller companies with batch production services. In speaking about the biggest challenges of starting their business, one of the founders noted that general business, legal and accounting services would have been helpful in addition to mentors to help guide them through the growth of their business. With the technology component of their business they were fortunate to access resources

Fig. 3.14 Hot Pop Factory inside Site 3

and services from MaRs but it was still difficult to access professionals with the experience to mentor them in the manufacturing and digital technology sector.

Key Takeaway

- Traditional businesses and service industries are incorporating emerging technologies and require the same support as the technology sector in accessing resources, knowledge, mentoring that can help grow their organizations
- Potential emergence of the mid-scale producer, batch production between the early prototype and full assembly line production

Fig. 3.15 Hot Pop Factory in the Basement of the Robertson Building

Centre for Social Innovation

Reference Date: June 21, 2016

After visiting Hot Pop Factory in the basement of the Robertson building I took the elevator upstairs to the Centre for Social Innovation, a non-profit organization providing affordable coworking space and business services for social entrepreneurs and organizations. I was welcomed by one of their community members when I arrived and learned that they volunteer part time at the front desk in exchange for a monthly hot desk, a drop in desk space in their open work and lounge area. I noticed the kitchen noticeably calm this afternoon but my tour guide explained the members were just settling down from the buzz of individuals coming together for free bagels offered earlier in the day. This was one of many ways they try to bring together CSI members in what they describe as "community animation". As a toured through the space, I noticed CSI was home to a mix of organizations that tended to be on the small scale with most only using a couple desk spaces at most. The larger organizations rent private offices of their own on another end of the floor. These observations were echoed by the CSI organization themselves as they note their focus on organizations with 5 or fewer members but many remain one or two man operations as they have

Fig. 3.16 The Robertson Building

identified these groups as having the greatest needs for shared facilities and administration and in the best position to collaborate and connect with others.

The idea for the Centre for Social Innovation began with a group of entrepreneurs who wanted to develop a new model for shared workspaces for social innovators. Too often organizations in the social sector were isolated and limited to substandard facilities. They wanted to improve access to office facilities while lowering the cost of administration to let organizations focus on their mission. In 2004, Urbanspace property group just purchased the Robertson building at 215 Spadina Avenue in Toronto and were in talks with the entrepreneurs interested in bringing together this space. Similarly passionate with their mission, the Zeidler family, owners of Urbanspace, offered to pay for the leasehold improvements for 6000 square feet on the first floor. After receiving operating grants for start-up and operational costs from the Ontario Trillium Foundation and the Harbinger Foundation they were able to open the workspace in June of 2004. Within several years, CSI managed to develop a waiting list of more than 40 organizations looking to become members in their space. In 2006, an additional 14,000 square feet of

Fig. 3.17 Centre for Social Innovation Spadina

office space became available providing an opportunity to expand within the same building. By 2007, CSI was home to over 180 social mission groups in the arts, environment, social justice and education sectors. As their organization continued to generate demand, CSI looked into the purchasing of a building of their own. However, even as a successful non-profit that operated for many years they had no assets to leverage and only $50,000 in accumulated surplus available. Meanwhile, the building they were looking to purchase cost $6.8 million to purchase and renovate.[5]

Securing financing required an innovative approach. CSI approached the city of Toronto and managed to obtain a loan guarantee which enabled them to obtain a mortgage for 75% of the projected value of the building after renovations opposed to the bank's original offer of 65% of the building purchase price. As a result, the loan guarantee allowed CSI to not have to fully finance the renovations and to secure a larger loan to value ratio, a riskier loan from lenders.[6] However, they still needed

5 "CSI Community Bonds," Centre for Social Innovation, https://communitybonds.ca/our-story/.

6 Ibid

Fig. 3.18 Centre for Social Innovation Annex

to raise $2 million to realize the project within a short period of time to secure the loan. So, they turned to their community to raise money through the creation of a new social financing product, the community bond.[7] The first community bond offered was established as an RRSP eligible investment opportunity with a minimum $10,000 investment providing 4% annual returns. The community bond was advertised as an "opportunity to make a blended value social and financial investment: to invest in our city, our community, and our shared future." CSI raised the needed funds in just 8 months to fully realize the project in 2010, opening the space to over 300 new organizations in the newly renovated 36,000 square foot facility. Since then, CSI has opened a new 10,000 square foot facility in Regent Park and a 24,000 square foot space in New York in 2012[8] and purchased another 64,000 square foot building in Toronto in 2014.

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7 A community bond is an interest- bearing loan that is accessible to unaccredited investors and can only be issued by a non-profit organizations. The community bond was developed to provide an alternative means to source capital by leveraging the assets of its community. Non-profits typically depend on large corporate entities and governments to provide capital funding which is either relatively limited or may not align with their social mission. At the same time, the average individuals that make up the non-profit community organization are limited in their ways to contribute to either volunteering or through modest donations. The community bond enables donors and volunteers to become community investors to create a space out of local necessity by leveraging the assets of the community.

8 "CSI Starrett-Lehigh: How it happened," Centre for Social Innovation, http://socialinnovation.ca/blog/centre-for-social-innovation-new-york.

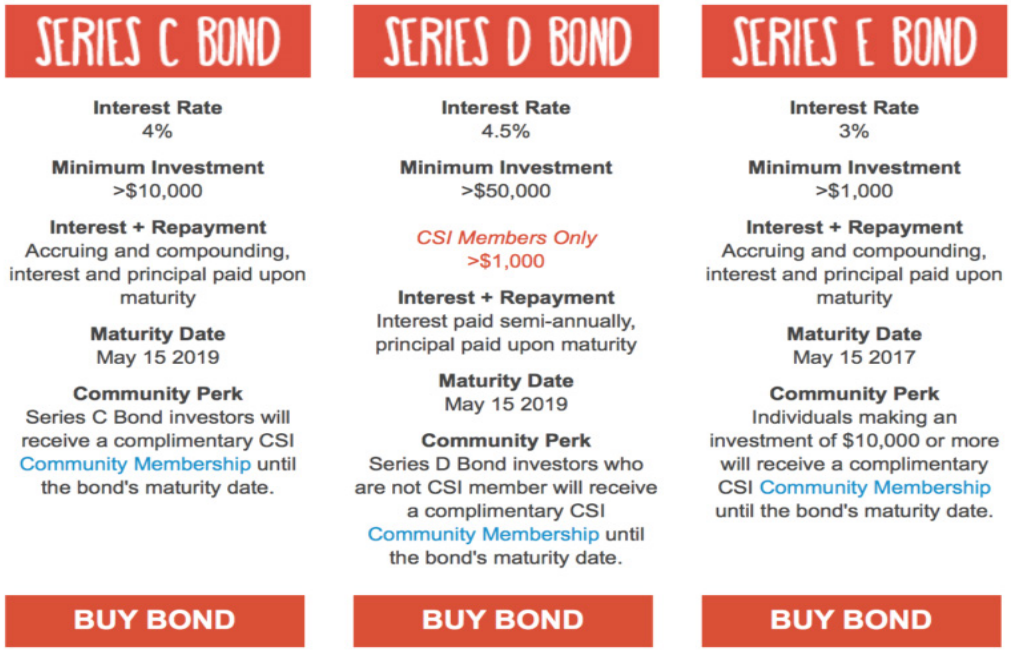

Fig. 3.19 Centre for Social Innovation Community Bonds

"This is a new model of raising money. It's a tool that allows us to change the way we design cities. We don't need to wait for the city to build new community centres, we can build them ourselves"- Tonya Surman[9]

Key Takeaway

- Building communities is optimal when bringing together organizations with five or fewer members because they are the most in need of shared resources and are most looking for potential collaborations and connections
- New social financing products provide new opportunities for communities to produce and access a space of their own
- Purchasing land and buildings is the key to affordability and securing a long term home for community first organizations while contributing to community wealth[10]

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9 Catherine Porter, "A new model of community centre building: Porter," Thestar.com, October 28, 2014, https://www.thestar.com/news/world/2014/10/28/a_new_model_of_community_centre_building_porter.html#

10 Tonya Surman, "We're at it again! CSI is buying a new building in Downtown Toronto!," Centre for Social Innovation, http://socialinnovation.ca/blog/we%E2%80%99re-it-again-csi-buying-new-building-downtown-toronto.

Fig. 3.20 Centre for Social Innovation 192 Spadina

10 Carden

Reference Date: July 22, 2016

The Centre for Social Innovation has inspired many organizations to follow a similar model to find a long term home for their respective communities. After visiting CSI, I sought out a local organization in Kitchener-Waterloo with the closest example being 10 Carden in Guelph. I got a chance to interview the founders to learn more about their history.

10 Carden is a not-for-profit community event space and co-working centre in Guelph. The organization was created in 2005 by several creative groups that were interested in working together. By 2009, in the wake of the economic recession they were able to find a space that was cheap, well located and accessible to the public on the main floor. Initially the organization was run through volunteers and remained self-funded through memberships, drop-in desk rentals and event space bookings. However, as their community grew and as the downtown was revitalizing the organization faced issues of long term financial sustainability. Though they were able to access government grants, the only option was to look

Fig. 3.21 10 Carden at the Former Acker's Furniture Building

into the purchasing of a building downtown if they were to maintain their location before rent increases pushed their organization out. In order to purchase their own building, 10 Carden followed the same model created by CSI by negotiating a mortgage based on community bonds. The process involves negotiating a mortgage with a bank and then a second mortgage is taken on top of the initial mortgage to allow for the issuing of community bonds. Funds generated from the community bonds are used as the down payment for the first mortgage. In the spring of 2016, 10 Carden was able to raise $400,000 through various community members and organizations to secure the mortgage and purchase the former Acker's Furniture building in downtown Guelph. The project is also funded by a mortgage, various capital grants, donations, services in kind, and private sector investment. The overall purchase and renovation is estimated at $2.5 million in order to comply to the Ontario Building Code and accessibility standards.[11] The project incorporates coworking space, office space for socially driven companies and institutions, and various community spaces such as a gallery, kitchen

11 Rob O'Flanagan, "10 Carden to Buy 42 Carden," GuelphToday, February 27, 2016, , https://www.guelphtoday.com/local-news/10-carden-to-buy-42-carden-202498.

10 carden

creating space for change

CIVIC LEADERSHIP BONDS

TERM SHEET (Dated April 20, 2016. For public circulation.)

We are pleased to provide you with this Term Sheet, reflecting the basis for our investment offering. The terms and conditions outlined herein will be finalized by June 2016. This summary of indicative terms and conditions for the prospective bond offering is for the Investor's use.

Date:	April 20, 2016
Offered by:	42 Carden Shared Space
Purpose:	Provide equity funding for the development of 42 Carden Street (Acker's Furniture Building), Guelph.

Series E Bond

E for EVERYONE,
FRIENDS AND SUPPORTERS

Interest Rate
3.0%

Minimum Investment
$1,000

Interest + Repayment
Interest paid semi-annually in June and December. Principal paid upon maturity.

Maturity Date
5 years from investment

Total Series E bond offering: **$400,000**

Series F Bond

F for FOUNDATIONS,
INSTITUTIONS AND ORGANIZATIONS

Interest Rate
4.0%

Minimum Investment
$50,000

Interest + Repayment
Accruing and compounding, interest and principal paid upon maturity.

Maturity Date
5 years from investment

Total Series E bond offering: **flexible**

CIVIC LEADERSHIP COMMUNITY BOND OFFERING: $1,600,000

All bonds are secured by a second mortgage on the property.
Total lending will be less than the post-renovation 3rd party property appraisal.

Fig. 3.22 10 Carden Community Bond

and rooftop garden. Set to open in early 2017, 10 Carden is an important precedent for community driven architectural development in the context of Kitchener-Waterloo region.

Key Takeaway

- Gentrification forced 10 Carden to grow and expand or dissolve as an organization but with help from the community they were able to raise enough capital to purchase a building of their own
- Proves the CSI model works in smaller cities as well and the social sector is of growing importance to communities

Fig. 3.23 10 Carden Renovation in 2016

Hacksmith Industries	Boko	Hot Pop Factory	Kwa
ENGINEER/ YOUTUBER	DESIGN PRACTICE	DESIGN/ MANUFACTURER	HACKE
1 person	2-3 people	2-4 people	50-60
hand power tools, metalwork equipment, laser cutter, filming and video editing	hand power tools, woodworking equipment vinyl cutter,	3d printers, laser cutter	desk space, han printer, laser cutte sewing and emb
1300 SF	1500- 2000 SF	500 SF	240
residential warehouse	storage warehouse	basement office	industri
Kitchener	Wellesley	Toronto	Kitc

Creative Businesses

Fig. 3.24 Creative Space Comparison

rtzLab	HackLab	10 Carden	Centre for Social Innovation (215 Spadina)
ERSPACE	HACKERSPACE	COWORKING SPACE	COWORKING SPACE
members	60+ members	60+ members	180+ members
d power tools, 3d er, cnc, electronics, roidery equipment	desk space, hand power tools, 3d printer, laser cutter, cnc, electronics, lab equipment	desk space, private offices, meeting rooms, library	desk space, private offices, meeting rooms
00 SF	3000 SF	15,000 SF	20,000 SF
al office	office	office	office
hener	Toronto	Guelph	Toronto

Shared Spaces

Agency in the Production of Space

Existing creative organizations in Kitchener-Waterloo, Guelph and Toronto have emerged from a community driven desire to design, collaborate, make and innovate in undesirable and often vacant industrial spaces.

> *"As for really new ideas of any kind—no matter how ultimately profitable or otherwise successful some of them might prove to be—there is no leeway for such chancy trial, error and experimentation in the high-overhead economy of new construction. Old ideas can sometimes use new buildings. New ideas must use old buildings."*[12]

While economically undesirable, old industrial buildings provide opportunities for experimentation for many groups that would not otherwise be in existence today. Even further, in speaking to creative individuals they often prefer the practicality and lack of over-aestheticization that can stifle the creative process. Old buildings can also provide an opportunity for communities to make spaces feel like their own by giving agency back to the users themselves.

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12 Jane Jacobs, *The Death and Life of Great American Cities* (New York: Vintage Books, A division of Random House, Inc., 2011), 188.

In the case studies described earlier these sites include peculiar industrial lots in a residential area, a warehouse facility, small basement space of an industrial building with no light or ventilation, and vacant industrial factories that were centrally located in the city. For small scale organizations, they took advantage of industrial lots embedded in residential areas balancing affordability and accessibility. These grassroots organizations often start out as temporary uses but grew into permanent establishments because of their strong following and community they build over time. Organizations that did grow into permanence developed a steering committee, a core group of individuals responsible for decision making and the ability to move the organization forward. Such lessons of organizational development and growth in smaller communities relied on building connections and learning from the more mature creative, maker and social sector communities in Toronto. In this sense, the 'innovation corridor' should encompass a wide range of sectors that share in the knowledge transfer.

As organizations grow there is an increasing importance of community building, both users of the space and external members, as growth tends to require expanding facilities, equipment and the raising of capital. Internally,

the building of community requires bringing together smaller organizations with the Centre for Social Innovation and the Velocity incubator in Waterloo both citing five or fewer people as the most optimal for collaboration and connection. Externally, community building is necessary as growing organizations in the creative and social sector have limited assets and capital reserves and increasingly rely on the assets of their community through donations, crowdfunding campaigns and new social financing tools. For larger organizations, long term sustainability relies on the purchasing of buildings to insulate themselves from the pressures of the market by taking back control over the means of production. These organizations redefine community driven development, no longer waiting for state intervention, to produce spaces of their own.

After interviewing creative organizations on a variety of scales from the individual maker working out of their garage to small design collectives and hackerspaces to large organizations providing space to a host of smaller groups, it was apparent their emergence followed a similar process. Creative organizations emerge from the process of developing a core community, organizing key decision makers, gathering funds and then finding a space for a

variety of activities. This process is repeated iteratively and over time organizations grow from the temporary to the more permanent spatial realm towards the leasing or acquisition of a space of their own. While the creative communities embedded in hacking, making, the arts, and tech culture are intertwined, they are individually unique and require a multiplicity of organizations to serve each community. This can be seen in the various hackerspaces that exist in Toronto with small variations in the tools, equipment and types of work each space is catering to. As architects, there is an increasingly important role in providing agency to these groups to develop their communities and spaces of their own. The following chapter aims to break down the process of moving an idea for a creative organization into a physical space and provide the basic considerations in the development of a creative lab of one's own.

CHAPTER 4:

DIY GUIDE TO THE PRODUCTION OF SPACE

Former Creative Space Initiatives in Kitchener-Waterloo

Kitchener- Waterloo has had a history of organizations and city-led discussions that have attempted to develop a space to support the creative industry but many of these efforts have been unable to organize or sustain their operations successfully long term. Through direct engagement and interviews with current and past creative initiatives in Kitchener-Waterloo, I hoped to discover the challenges that individuals, organizations and city planners face in developing a creative space. Reference dates are given for when the interview, consultation or participation in an event took place.

In working with a local theatre group that had the hopes of expanding on their existing space, their most pressing challenge was in organizing a decision making team as well as the process in developing the spatial and financial model that would ensure long term sustainability. On the other hand, former initiatives such as the Creative Enterprise Initiative, an organization to showcase arts and culture to attract talent to the region, were unable to sustain their operations because their general lack of engagement with the communities they were hoping to serve.

As the city of Kitchener prepares for the development of a Creative Hub, a space to bring serve industries such as music, film, interactive media, and theatre, it is important for stakeholders to understand past initiatives and the potential reasons for their failures to remain sensitive in creating future solutions to the same communities. The following chapter will involve a summary of the interviews, my experience and analyses of spatial development processes in working with a local theatre company, MT Space, a former creative organization that attempted to bring together the creative community, The Creative Enterprise Initiative, and the current city consultation process that was involved in forming the basis for the Kitchener Creative Hub. In response to these challenges, a Do-It-Yourself guide was created to illustrate a process that can provide agency to creative organizations to develop a supportive infrastructure that can better address the needs of the local creative sector.

Reference Date: May 2016

MT Space

Founded in 2004, MT Space creates and produces artistic performances and cultural events that reflect the multicultural heritage in the Kitchener-Waterloo region. In addition to theatre, MT Space offers educational programs and professional development workshops to local artists. MT Space is currently located in the former Bonnie Stuart Factory, a building shared with other arts and design organizations as well as a non-profit that provides affordable studio spaces to artists in the region.

Though MT Space has been successfully operating in the former factory in addition to renting various theatre venues within the region, they sought to provide more accessible, community driven and theatre specific space to grow their audience and organization. As a result, MT Space approached Rick Haldenby and I as architectural consultants in the search for an alternative space to bring together likeminded individuals and organizations within the performance arts sector.

Fig. 4.1 Bonnie Stuart Factory

We organized a group discussion with their core members to develop a vision for their ideal space. The exercise aimed to understand the challenges of their current space, the characteristics and qualities of their audience or community they service, the activities and programs they provide and their long term goals and mission for the organization. We summarized this information and formed the basis for an architectural program that began to quantify some of the organization's spatial needs that was necessary in the examination of potential properties as future sites.

However, before any further design could take place, the organizational and financial framework in which such a space would operate needed to be determined. Such questions as: Which individuals and organizations are serious in partnering towards a space? Who would ultimately own or operate the space? How will the organization finance the space's capital and operating expenses? Therefore, such a project cannot move forward without the ability to effectively organize individuals towards the formation of an organization that could see this vision through.

Fig. 4.2 The Courtyard inside the Bonnie Stuart Factory

Key Challenges

- Many organizations have yet to identify the primary stakeholders who are interested in working together to develop a collective space and are therefore unable to determine the spatial parameters that can inform a design or financial model

Fig. 4.3 The Registry Theatre

Reference Date: November 2016

The Creative Enterprise Initiative

The Creative Enterprise Initiative(CEI) was officially established in 2009 by the Prosperity Council to promote the development of arts and culture.[1] As part of the initiative, the CEI studio was launched to provide affordable studio spaces to local artists as well as for meetings, events and workshops. Notable tenants include: Arty Art, Collaboratory6, My Eye to Yours, FanDanGo, Sculption, Strataform Studio, Roslyn Ramsay, Spectrum, Martina & Mirella Vigini, and Simona Zac. Though largely funded by the cities of Kitchener, Waterloo, Cambridge and the region, CEI aimed to secure funding for local artists from private investors as well as public investment from other levels of government. CEI also developed grandsocial.ca which helped bring exposure to arts and culture events through various social media platforms.

By 2014, CEI had received $950,000 in operations funding from the city but their role and purpose in arts and culture

1 "Creative Enterprise Initiative," Prosperity Council, http://www.prosperitywaterloo.ca/council-initiatives/creative-enterprise-initiative/.

Fig. 4.4 Creative Enterprise Studios in Former LCBO

was still unclear to many local creative organizations. In 2015, CEI announced that it would dissolve its board and end all activities by the end of 2016. They cited that their two top priorities: to help people in Waterloo Region find entertaining things to do and to help local groups collaborate and come up with creative projects to tie the region together, did not require a stand-alone organization.[2] As CEI winds down its operations, former creative practices will have to relocate to new spaces in a region with an already limited inventory of creative and affordable spaces.

Key Challenges

- The creative residents were not consulted in the management, funding or operations of the space and had little authority to work and communicate through any challenges or issues that would arise

2 "CEI asking for $300K to end operations," CBC news, December 09, 2015, http://www.cbc.ca/news/canada/kitchener-waterloo/creative-enterprise-initiative-cei-asking-for-300-thousand-to-close-1.3358014.

Fig. 4.5 Creative Enterprise Studios Interior

Reference Date: September 20, 2016

Kitchener Creative Hub

In 2015, The City of Kitchener launched a new economic plan, Make it Kitchener, which identified the establishment of a 'creative hub', a space dedicated to the development of the arts and creative sector, as a key contributor to the city's economic success. The creative hub aims to support such industries as music, film, interactive media, theatre, literary and visual arts by providing affordable space, entrepreneurial and promotional services, skills development and event programming. Since 2012, the city has engaged in community consultation to understand how creative industries could be further supported through various initiatives. In 2016, city council directed staff to proceed with community and stakeholder engagement to define the vision, needs, and potential locations for a creative hub. The community consultations took place over the course of three events:

- Defining the vision and function of the creative hub
- Defining the services, activities and spaces needed and potential venues for the creative hub
- A drop-in information session with opportunity for open commentary on the creative hub initiative.

Fig. 4.6 Kitchener City Hall

Over 300 people spanning the spectrum of creative industries participated throughout the series of consultation events.

Key Challenges:

- Diversity of artistic range
    - Participants were often unaware of each other's practices and very different spatial needs. As a result, some intersections between artistic practices were not ideal due to noise, lighting, electrical, mechanical or ventilation needs, etc.
- Space allocation
    - The opportunity for a creative hub as presented by the city may not have enough space to satisfy all the needs presented by the various creative sectors. Determining a strategy to support the current initiative as well as future self-led initiatives is critical to growing the creative community.
- Organization
    - Understanding how the creative hub would be owned and operated was still unclear especially with numerous stakeholders

Fig. 4.7 Kitchener Creative Hub Consultation

weighing in on the potential direction of the space. Discussions on the opportunities and mechanics of how individuals and organizations can form partnerships.

One of the heavily discussed topics was potential sites for the creative hub, with the buildings at 48 Ontario and 44 Gaukel being leading contenders as city owned buildings. As 48 Ontario sat vacant since 2001, the building required extensive renovations which was a significant factor in the final decision to sell the building using half the proceeds towards the development of a creative hub at 44 Gaukel. A Request for Proposal (RFP) process was initiated in early 2017 by the City of Kitchener to solicit proposals from organizations outlining how they would operate and achieve the Creative Hub vision articulated in the consultation process.

Fig. 4.8 Kitchener Community Consultation for Potential Venues for Creative Hub

Challenges in Developing Space

In the organization of creative spaces, there are a variety of unique issues that emerge from the development process. For bottom-up creative initiatives, they require collaboration and the development of partnerships to pool resources towards a collective space but this becomes an inherent challenge in that it requires greater amount of co-operation, negotiation and communication to effectively organize amongst multiple stakeholders and potentially slightly varying individual needs. The establishment of a decision-making committee is required to set a clear plan and course of action in moving the collective goals forward. Without key decision makers, it is difficult to maintain accountability within a larger group of individuals let alone multiple organizations.

Top down initiatives led by the state or institutions are arguably more organized but failure to consult and engage with the community they hope to serve risks not addressing the needs or lack the understanding to solve the key issues of the community. These initiatives require leadership from the creative communities to be directly involved to help communicate their needs and how best to achieve it. Through continued engagement, managing organizations and the creative community will develop a collaborative

relationship that can work together towards collective objectives rather than of a hierarchical relationship that commands and controls.

City led consultations towards a creative space took on a more collaborative approach in engaging with the community but with such diversity in the creative communities it was difficult to organize productive discussions to develop ideas into actionable plans. In addition, the highly regulated Request for Proposal (RFP) process created an environment of competition rather than collaboration amongst stakeholder groups that would allow for creative intersections and cross sector collaborations. As a result, the very purpose of the space, to promote knowledge sharing, interaction and community building was not encouraged during the proposal process itself.

While the intersections of creative fields in the arts, design, technology and social sector can promote innovative collaborations, not all needs can be addressed in a single collective space. A multiplicity of organizations should be embraced by promoting the agency in which these communities can connect and develop partnerships of

their own. The facilitation of discussion to provide the outlet to form these partnerships can catalyze individuals and multiple organizations to collective organize, plan and lead a creative space from the bottom-up. Ultimately, looking at existing grassroots creative organizations we can derive a process based approach in building community, organizing decision makers, establishing funds and finding space, to inform how new spaces of production can start-up.

Do-It-Yourself Guide

Cooperation, organization and collaboration amongst creative individuals is needed to develop new spaces of production for various needs in the community. Through interviews with various makers, creative entrepreneurs and organizations, a framework was developed that incorporates the knowledge, tools and processes that made each of these organizations successful. The following is a do-it-yourself guide created to give agency to the creativity community towards the development of a space of their own. The guide incorporates community building, organizational development, spatial mapping and business modelling in an experimental process that encourages the development of a project intervention that begins to test each of these important pillars. This process is iterative and requires the bridging of ideas with physical experimentation to confront the political, social, spatial, and economic challenges emerges as such a project is realized over time. Using an iterative method derived from design and lean thinking, organizations will be able to develop a model that is appropriate to the individuals, activities and scale of their communities. The hope is that communities can begin to take advantage of existing spaces in the city as sites of experimentation for communal gain with the potentiality for their long term and more

permanent use. Without providing agency to these creative communities, cities risk producing space that solely rely on existing capital accumulative models. A physical copy of the DIY Guide has been included at the back of this thesis.

Fig. 4.9 DIY: Hackerspaces, Collectives & Hubs Guide

Prototyping Community and Space

The following section outlines the process in which a project moved from plan to action using the urban prototyping canvas. The project focuses on the creation of an event to grow the design community in Kitchener-Waterloo. While local institutions and businesses are fueling the growth of design, there is an opportunity to develop a design culture and community into the mix of creative sectors in the region by building from the existing communities that have already been established. The creation of an event that seeks to bring together designers within the greater community begins to determine the context, program and need for a permanent and dedicated creative space.

The first iteration of the urban prototyping canvas brainstorms potential project concepts and partners to collaborate with. It begins to hypothesize and bring together a road map for a project that can be further discussed with other stakeholders. Using the canvas as a visual tool and summary of my objectives, I reached out to different organizations to discuss if there were any shared goals between my project ideas and some of their ongoing initiatives. There must be a mutual benefit for all partners involved to motivate and ensure that the project moves forward and is successful.

URBAN PROTOTYPING CANVAS

Problem

What are crucial problems faced by your audience?

-designers (UX, UI, architecture, interiors, industrial, graphic, etc.) have limited opportunities/ don't know where to go to connect to the design community in KW

Audience

Who is your target audience? Identify several audience groups your solution is geared toward.

-designers (UX, UI, architecture, interiors, industrial, graphic, etc.)

Unique Value Proposition

What makes your solution different than existing ones?

-events for designers of all types (not just digital media or for makers)

Solution

What is your solution to your audience's problem?

-meetups, workshops, networking events focused on expanding the discourse of design and grow the design community in KW

Partners

Who are your key partners?
What activities and/or resources do they help you acquire or assist with?

-DesignChats

-UxWaterloo

-Brew Over Design

-City of Kitchener

Fig. 4.10 Urban Prototyping Design Event Iteration 1

Activities/ Resources

What key activities or resources does your solution require?

- finding a venue
- projector, furniture
- food/catering, alcohol licensing

Funding

For what value are your customers willing to pay?

How much does each revenue stream contribute to overall funding?

- venue (sponsored)
- projector (potentially sponsored)
- local company sponsors ($500-1000)

Cost

What are the most expensive costs inherent in your solution?

What are the costs associated with the key resources/activities?

- venue (sponsored)
- food/catering/drinks ($500 or less)
- furniture/ equipment rental ($500)

Metrics

How will you track your solution's performance or success? (attendees, engagement, revenue generated)

- number of attendees
- new member signups on website/ meetup group

Reference Date: July 2016

After discussing the project with potential partners, I decided to collaborate with the DesignChats group as their mission aligned with my project goals: to grow the design community (including software, digital media, industrial, graphic and architecture) and discourse in Kitchener-Waterloo. While there were other organizations and meetup groups, many often focused on one specific community whether it be software, digital design or making. With the success of a design film event in the summer, DesignChats was also an ideal community to work with as we could build off the momentum established from their previous event. In partnering with DesignChats, I was able to further their mission to grow the design community while their team was able to bring the insight and knowledge from previously planned activities.

Once the core team was established we naturally split into differing roles: I focused on the logistics while the lead from DesignChats focused on developing additional community partnerships. My main task involved finding a venue and the associated logistics with equipment, furniture, and licenses depending on the resources available at each location.

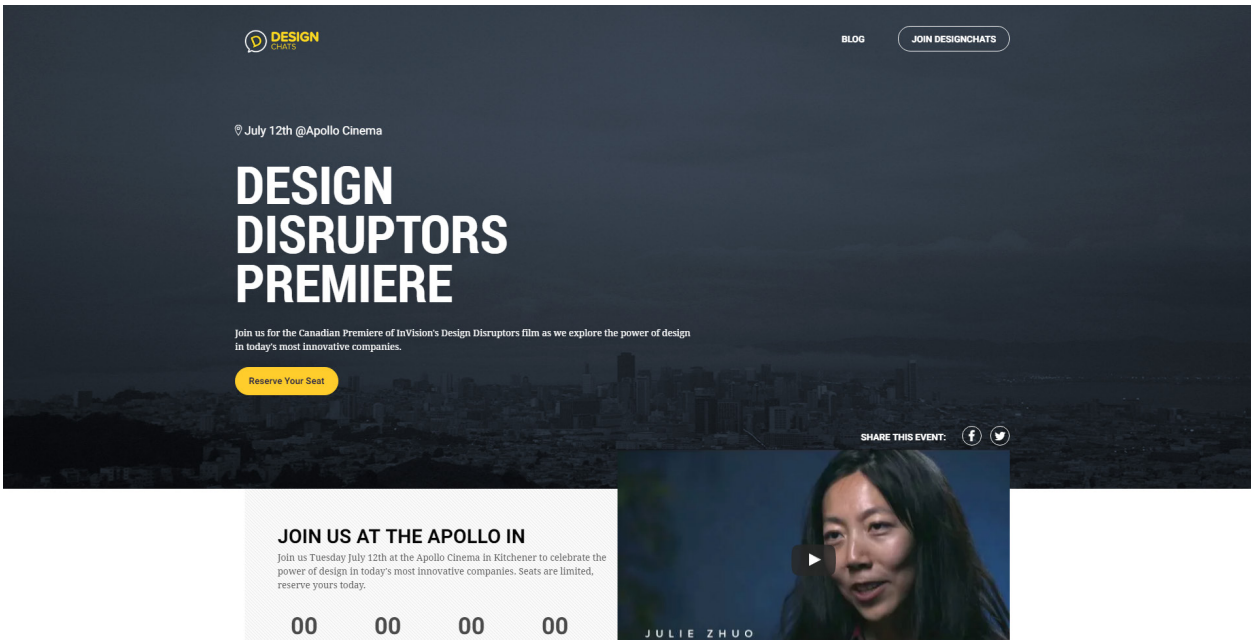

Fig. 4.11 DesignChats Website

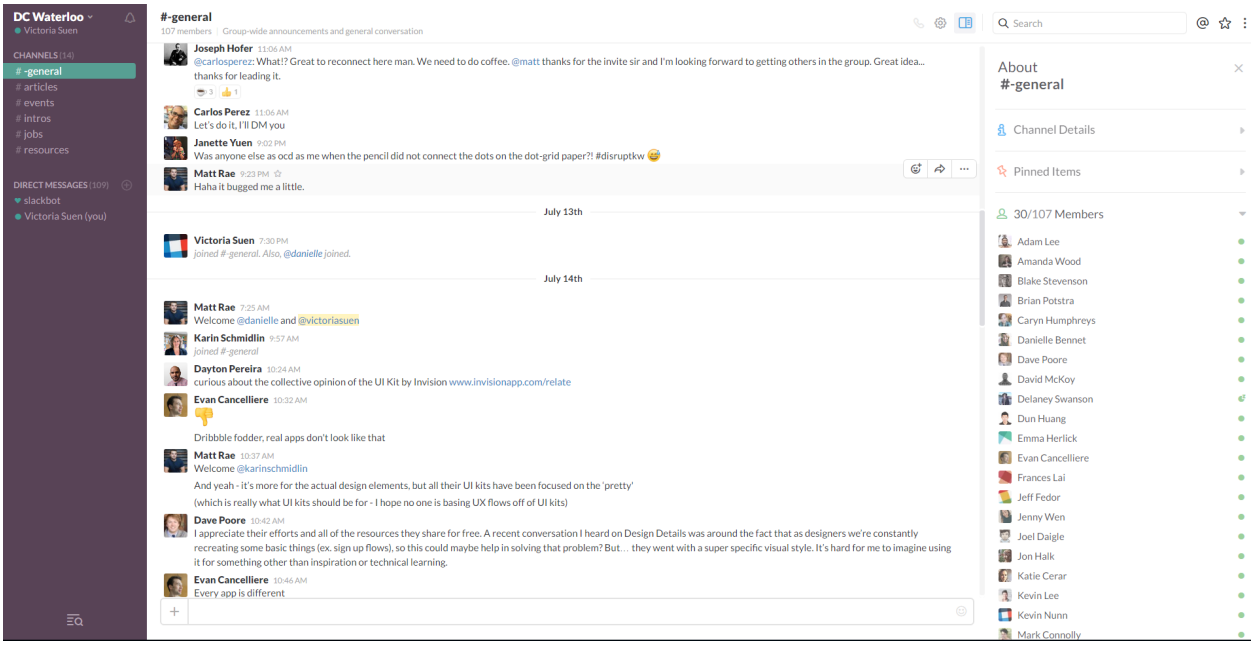

Fig. 4.12 DesignChats Slack Channel


1
2
3
4

1. Shopify Office
2. Knox Church
3. Button Factory Arts
4. Distillery Labs

Fig. 4.13 Available Spaces in Downtown Waterloo (Fall 2016)

URBAN PROTOTYPING CANVAS

Problem

What are crucial problems faced by your audience?

-designers (UX, UI, architecture, interiors, industrial, graphic, etc.) have limited opportunities/ don't know where to go to connect to the design community in KW

Audience

Who is your target audience? Identify several audience groups your solution is geared toward.

-designers (UX, UI, architecture, interiors, industrial, graphic, etc.)

Unique Value Proposition

What makes your solution different than existing ones?

-events for designers of all types (not just digital media or for makers)

Solution

What is your solution to your audience's problem?

-networking event to develop a discourse around the role of design in the city and grow the design community in KW

Partners

Who are your key partners?
What activities and/or resources do they help you acquire or assist with?

DesignChats

Shopify

Fig. 4.14 Urban Prototyping Design Event Iteration 2

Activities/ Resources

What key activities or resources does your solution require?

- advertise event to local community and encourage RSVPs

Funding

For what value are your customers willing to pay?

How much does each revenue stream contribute to overall funding?

- venue, projector, furniture, catering (provided by Shopify)

Cost

What are the most expensive costs inherent in your solution?

What are the costs associated with the key resources/activities?

- none (fully sponsored)

Metrics

How will you track your solution's performance or success? (attendees, engagement, revenue generated)

- number of attendees
- new member signups on website/ meetup group

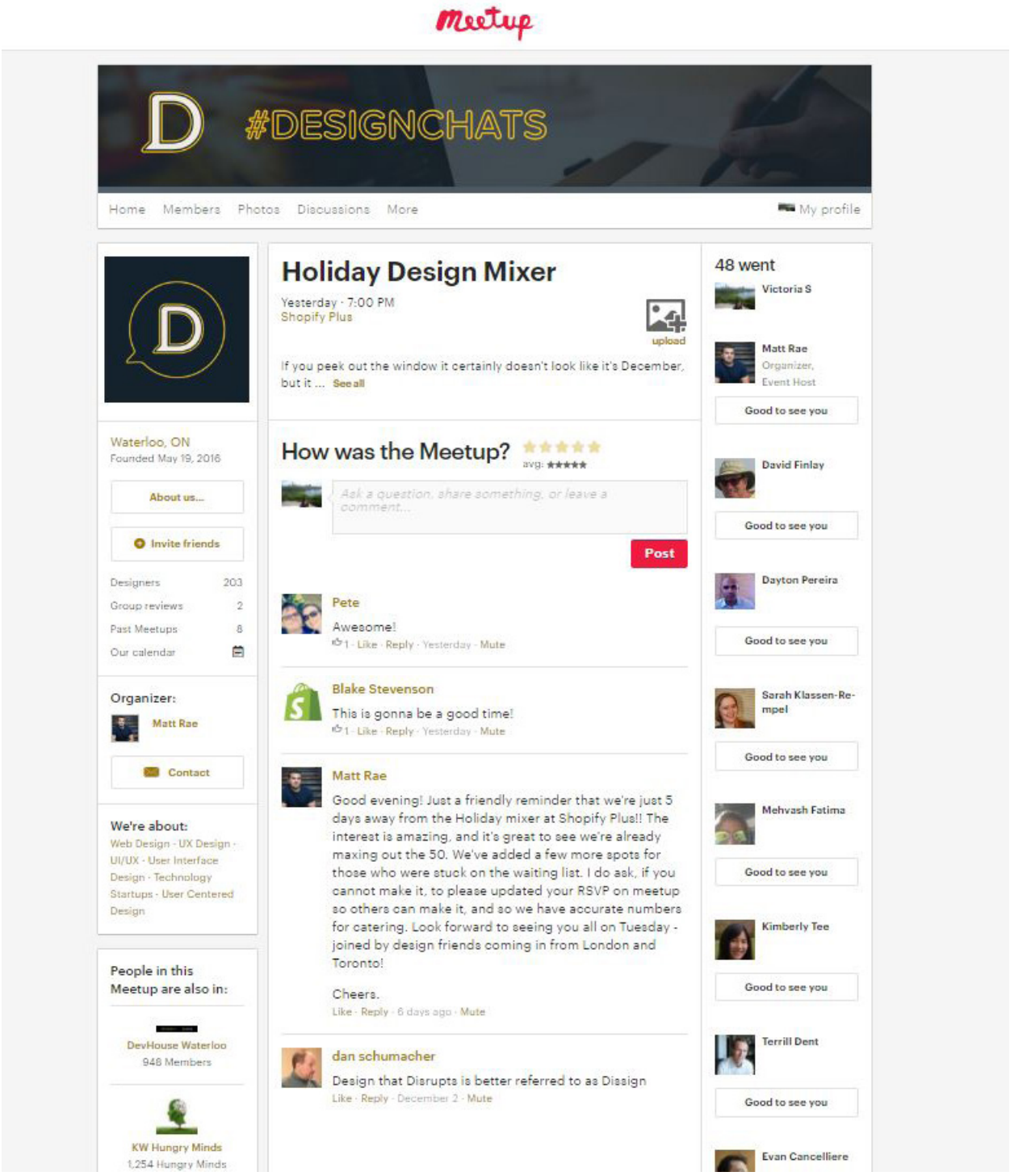

Fig. 4.15 Design Event Registration Page

A map was to create to visualize the potential locations where property owners, organizations or companies were willing to provide space for a temporary event. This resource can be shared across different community groups looking to start an event of their own. While there were a number of property owners willing to lend their spaces out temporarily, many lacked the equipment needed for certain types of events such as projectors and furniture for film screening, audio equipment for a speaker series or general licensing for public events. This increased financial and human resource costs and made these locations less viable to quickly plan and carry out an event.

Ultimately logistics and the additional planning involved for a workshop, speaker or film series didn't fit within the project timeline that was set. As a result, an additional industry partner, Shopify, was brought on to help with the event. Shopify is a technology company that develops software for online stores and naturally also had an interest in being part of growing the local design community. As a partner, they provided the venue, sponsored catering and drinks and provided additional human resources to help plan the event.

Fig. 4.16 Design Event Networking

The planned event focused on networking with various designers in the region. The event was advertised on social media channels such as slack and meetup and had a sold out attendance of 50 people. Various holiday craft stations were set up to encourage interaction between new members of the community. It also doubled as an event to learn more about the design culture of the local company and to learn more from the individuals working there first hand.

Successful events are created by strong teams that work towards a collective goal. It is important to understand the goals of your partners because each group or organization may have different objectives or motives for participating. It is important for these goals to align to provide mutual benefit to all. This particular challenge may arise in mixing community, industry or institutional groups together as they may have separate policies or practices that prohibit a certain type of activity. Understanding these limitations in search for a solution is essential to ensure the goal of the project can be achieved.

The Holiday Design Mixer event was successful in showing that there is a growing interest in design in the region and

more activities like these need to take place to build the design community even further. However, organizations do need to be wary of duplicating a concept if it has proven to be successful and must plan for variation to continue to maintain interest and attract individuals to attend future events. Organizations need to continue to question how each project, whether temporary or more permanent, is bringing new value to the members of its community. The ability to attract eventgoers to re-attend future events is essential to increase the frequency of interaction between individuals and hopefully as a result, deeper connections and relationships are formed to give a sense of community. While using temporary locations reduce the financial risk of owning a space, there are also limitations on how these spaces can be used depending on the agreements made with the space provider. This can range from the types of events that can be organized, the types of people who can or cannot attend, or the length of time the project can take place.

Ultimately, a permanent location that provides the freedom and flexibility of different spatial programs to foster connections between various creative individuals can only be ensured if owned and operated by the intended users

of the space. Temporary events and spaces are needed to collectively organize group and committees willing to plan, organize, bring together community to fulfill spatial needs.

CHAPTER 5:

CONCLUSION

Through the process of engaging with design groups and individuals in the creative community, it was apparent early on that it often took years to build the sense of community that individuals connected to. Even for many of the design groups that were in their first or second year of existence, it was important for them to build the community before opening their groups to a larger audience. In order to accelerate and test the urban prototyping process it was important to find community partners and organizations that already had an established community with aligned goals. Partnering with such organizations have three main benefits: experience in previous in projects or events, knowledge of the needs of their community and an existing audience to build from. Community partners are especially important to attain community buy-in when organizers are not directly affiliated with the audience they are trying to cater to.

Architects, city governments and creative communities can learn from existing organizations that have engaged in the practice and experimentation in the creation of a space of their own. The various interviews and spatial investigations in emerging spaces of production provide valuable insight into the strategies and processes of bottom-up formation

of these grassroots communities. As urban designer Aseem Inam states,

> *"consequences of an idea in practice can help us distinguish the intent of a particular value, belief, or theory from thoughts and unnecessary abstractions that make no practical difference."*[1]

Formal designers can learn valuable knowledge from the community's direct experience, former experiments, trials and errors that can inform continued research and design. Therefore, architects should learn to leverage the knowledge that can be gained from informal spatial experimentation driven by community need as well as their formal design skills and tools. As a result, there is a shifting relationship between the architect and the community client in the development of a co-operative working relationship that works together towards the identification of design problems and the creation of solutions. The architect must recognize the network of knowledge within the various stakeholders in the community to facilitate the organization, negotiation and complex cooperation in the collective movements towards a community goal. At the

1 Aseem Inam, *Designing Urban Transformation* (New York: Routledge, 2014), 34.

same time, there is a limitation of the architect as they can't force social cooperation amongst individuals and organizations. However, they can set the conditions for a process of engagement that can encourage more socially co-operative collaboration. As Richard Sennett states,

> *"social architecture embodies three phenomena, because it requires skill: it requires the skills of dialogic exchange, it requires modes of expression that are subjunctive rather than declarative, and it requires an address to the other and an understanding of the other that is empathic rather than sympathetic.*[2]

Only through the development of these socially cooperative skills can communities begin to develop a corresponding social architecture that materializes their ideas, values and needs.

The need to bring the community building, organization, spatial design and finance into a systematic process to produce a community space is reflective of the increasingly integrated social, political, and economic spheres. As the mode of production shifts from industrial capitalist relations to socialized virtual networks, so too will the predominant

2 Richard Sennett, *The Architecture of Cooperation,* 237.

space of production. The shift from the industrial to the virtual city, marks the potential for a post-capitalist space that takes advantage of the knowledge based networked economy in new spaces of cooperative production. The defining architectural type in the virtual city is the laboratory in its varied forms, spaces of experimentation, knowledge sharing and cooperation. As we are currently experiencing this shift towards the virtual city, I sought out the processes and challenges to find meaning in the emergence of these new spaces of production and their potentials as post-capitalist spaces.

If we consider the collective network of vacant and underutilized buildings in the city as immediate sites for experimentation, then we can understand the city as a laboratory. As Jane Jacob writes,

> *"Cities are an immense laboratory of trial and error, failure and success, in city building and city design. This is the laboratory in which city planning should have been learning and forming and testing theories."*[3]

Therefore, vacant sites and buildings are opportunities to experiment in creating these new spaces of cooperative

3 Jane Jacobs, *The Death and Life of Great American Cities*, 6.

production. Kitchener-Waterloo having developed with industry uniquely centred within the city, has an inventory of industrial sites that are opportunities of experimentation situated on the 'edge' as Richard Sennett describes,

> *"The physical foundation for a social architecture is a certain experience of the edge where both porosity and resistance are enabled."*[4]

The experience of the edge provides an opportunity for a mixing of differing zones, industry sectors, groups, people that begins to teach individuals how to be social cooperative. This is imperative, as Richard Sennett states,

> *"The problem with urbanism today is that the boundary (where interaction is diminished) dominates over the border (where exchange intensifies), forbidding the creation of spaces where complex cooperation can be learned."*[5]

As work and the city become increasingly virtual, architecture and architects take on the critical role of bringing people physically together. As a result, in the process of developing a new a space and system for creative and cooperative production the architect must take on a more expansive

4 Richard Sennett, *The Architecture of Cooperation,* 232.

5 Ibid, 237.

role in design to include community and organizational development or rather the processes of its production. Before any spatial design can take place, a community must be established to inform the program and needs while an organization must be established to physically create it. In designing an architecture for social interaction, architects must design a process to create the social conditions in which a physical space can be produced. The creation of the social conditions for a space to be produced is also the biggest challenge because the difficulty in encouraging cooperation amongst individuals and organizations of difference. The challenge of cooperation also highlights the increasingly important need to develop these spaces to provide opportunities to develop cooperative skills to help individuals and organizations to achieve something greater than they could on their own. In the new economy, Negri describes, "the surplus added in production is derived primarily from socially productive cooperation."[6] This surplus value materializes in the form of individual capital or social capital but their distinction is dissolving as the mode of production is becoming socialized. Dominance and power in the new economy lies in the

6 Antonio Negri, "Reflections on #Accelerate," *in* #Accelerate: The Accelerationist Reader (Falmouth, UK: Urbanomic Media), 369.

control over the flows of distribution, consumption and exchange compared to the material means of production in the industrial economy. However, architecture and space operates in between the social and material modes of production and so, has the opportunity to democratize the flows of distribution, consumption and exchange and cementing this importance in the social fabric of the city. The community's ability to organize a space of production materializes the formation of a socially cooperative community network and in turn, creates an environment in which complex cooperation can be learned and access to space, equipment and knowledge needed for production is available for individual desire and use.

However, this requires the role of the architect to take on a more holistic understanding of how to bring people together, organizationally, spatially, financially and politically. If individuals in the community fail to organize, design cannot begin to play a role in the construction of an alternative system. At the other end, if a program and design is created with little consideration of the financial implications and operating costs, then the space is bound for failure. Community and organizational development, a workable financial model and design must be integrated

in the architect's working process and requires continuous testing and feedback to ensure a space's success. As a result, the architect must take on the additional roles of community builder, facilitator and entrepreneur. The community builder brings people together by organizing events, sharing knowledge and providing their expertise for the sake of building that community. The architect as facilitator connects the community as the intermediary whether it's with property owners to help find a venue, assisting with permits with the city or acting as a building consultant to allow creative community to carry out actions on their own. The architect as entrepreneur assists in the consideration of the economic feasibility of an event, project or building. The entrepreneur helps understand the costs and realistically what can be designed and funded. Together, the architect is building towards the development of a social architecture that increasingly gives agency to their community. Therefore, architects must engage and work with their communities to create a space in which the communities can ultimately carry out themselves.

While this requires a more connected community to identify and take advantage and plan for these spaces, it also requires better planning tools to encourage participation

and action. The DIY guide was developed to encourage individuals to become self-starters and plan for such projects with potential partners, sponsors, volunteers and city governments. Rather than a blueprint for a successful space, the creation of process for urban experimentation was required to adapt to the changing needs and systems that each community is a part of. As architects, this is increasingly important to design a process in which the community can be given agency to plan and produce a space of their own. This importance is described by Lefebvre in *The Production of Space*:

> *"(Social) space is a (social) product….space has taken on… a sort of reality of its own, a reality clearly distinct from, yet much like, those assumed in the same global process as commodities, money and capital… space thus produced also serves as a tool of thought and of action; that in addition to being a means of production it is also a means of control, and hence of domination, of power…"*[7]

The community's ability to re-engage with the production of space is the reclamation of power and control in the building of the city and the shaping of their everyday lives.

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7 Henri Lefebvre, *The Production of Space* (Malden, MA: Blackwell, 2016), 26.

For makers, this re-engagement with the material and physical world is a means in which to escape the circuits of capital and the continuous cycle of growth. As Richard Sennett states,

> *"Our modern economy privileges pure profit, momentary transactions and rapid fluidity. Part of craft's anchoring role is that it helps to objectify experience and also to slow down labor. It is not about quick transactions or easy victories. That slow tempo of craftwork, of taking the time you need to do something well, is profoundly stabilizing to individuals."*[8]

In a world where everything and anything can be monetized, the role of making and material labour in the shifting economy is to provide an outlet to achieve individual desire and meaning through the working process rather than for sheer economic value or return. While new spaces of production are emerging from the community level to respond to this collective desire, their long-term sustainability is still threatened by economic pressures in rapidly growing urban centres.

It is at this intersection that architects must position

8 Suzanne Ramljak. "Richard Sennett on Making." American Craft 69, no. 5 (October 2009): 48. Art Full Text (H.W. Wilson), EBSCOhost.

themselves, as these community spaces of production move into a precarious state. The need to construct permanence requires the expansion in the role of the architect as a community organizer in developing the physical social network, by bringing together the knowledge and connections within the community to socially produce space. In the virtual city, the architect is not a builder in and of themselves but rather a designer through the mediation and mobilization of organizations, systems and networks of people towards the building of a city that reflects the community.

BIBLIOGRAPHY

"112km of Innovation." Thecorridor.ca. https://thecorridor.ca/.

"About Fluxible." Fluxible Canada's UX Festival. ttp://www.fluxible.ca/wp-content/uploads/2016/03/Fluxible2016-Sponsorships.pdf.

Allen, Thomas John. *Managing the Flow of Technology*. Cambridge, MA: MIT Press, 1984.

Anderson, Chris. *Makers: The New Industrial Revolution*. New York: Crown Business, 2012.

Balkissoon, Denise. "Hackers: Not Just Geeks, but Activists." Thestar.com. April 06, 2010. Accessed April 11, 2017. https://www.thestar.com/news/gta/2010/04/06/hackers_not_just_geeks_but_activists.html.

Balkissoon, Denise. "Toronto Makers and Hackers Share a Philosophy on Tools." The Globe and Mail. March 15, 2013. Accessed April 11, 2017. http://www.theglobeandmail.com/news/toronto/toronto-makers-and-hackers-share-a-philosophy-on-tools/article9837168/.

Brown, Tim, and Barry Katz. *Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation*. New York, NY: Harper Business, 2011.

Cavalcanti, Gui. "Is It a Hackerspace, Makerspace, TechShop, or FabLab?" Make: DIY Projects and Ideas for Makers. May 22, 2013. http://makezine.com/2013/05/22/the-difference-between-hackerspaces-makerspaces-techshops-and-fablabs/.

Chuang, Isaac, and Neil Gershenfeld. MAS.863 How to Make (Almost) Anything. Fall 2002. http://ocw.mit.edu.

License: Creative Commons BY-NC-SA

"CSI Community Bonds." Centre for Social Innovation. Accessed April 11, 2017. https://communitybonds.ca/our-story/.

"CSI Starrett-Lehigh: How it happened." Centre for Social Innovation. Accessed April 11, 2017. http://socialinnovation.ca/blog/centre-for-social-innovation-new-york.

Deleuze, Gilles, and Félix Guattari. *Anti-Oedipus: Capitalism and Schizophrenia*. Minneapolis: University of Minnesota Press, 1983.

English, John, and Kenneth McLaughlin. *Kitchener An Illustrated History*. Toronto: R. Brass, 1996.

"Fab Lab FAQ." The Centre for Bits and Atoms. http://fab.cba.mit.edu/about/faq/.

Farby, Julie. "The Hive Hopes To Revolutionize Traditional Office Space By Creating "Coworking" Space." AHN. March 13, 2007. http://web.archive.org/web/20070317225120/http://www.allheadlinenews.com/articles/7006731137.

Florida, Richard L. *The Rise of the Creative Class: Revisited*. New York, NY: Basic Books, 2012.

Foertsch, Carsten, and Remy Cagnol. "The History Of Coworking In A Timeline." Deskmag. September 02, 2013. http://www.deskmag.com/en/the-history-of-coworking-spaces-in-a-timeline.

Fontinelle, Amy. "What is a Mortgage." Investopedia. February 16, 2017. http://www.investopedia.com/terms/m/mortgage.asp.

Forest, Conner. "Accelerators vs. Incubators: What Startups Need to Know." TechRepublic. November 17, 2014. http://www.techrepublic.com/article/accelerators-vs-incubators-what-startups-need-to-know/.

Freudenberger, Herman, and Fritz Redlich. "The Industrial Development Of Europe: Reality, Symbols, Images." *Kyklos* 17, no. 3 (August 1964): 372-400. doi:10.1111/j.1467-6435.1964.tb01748.x.

Gershenfeld, Neil. "Digital Reality A conversation with Neil Gershenfeld." Edge.org. January 23, 2015. https://www.edge.org/conversation/neil_gershenfeld-digital-reality.

"Governor General's Medals in Architecture — Past Recipients." RAIC | IRAC Architecture Canada. https://www.raic.org/raic/governor-generals-medals-architecture-—-past-recipients.

"Granting." McConnell Foundation. http://www.mcconnellfoundation.ca/de/granting.

Haldane, Elizabeth Anne. "The Historical Geography of Waterloo Township, 1800-1855." Master's thesis, McMaster University, 1963.

Hardt, Michael, and Antonio Negri. *Empire*. Cambridge, MA: Harvard University Press, 2006.

Harvey, David. *The Urban Process under Capitalism: A Framework for Analysis*. Oxford: Blackwell, 1978.

Harvey, David. *The Limits to Capital*. London: Verso, 2006.

Harvey, David. *Rebel Cities: From the Right to the City to the Urban Revolution*. Brooklyn: Verso, 2013.

Hernandez, Deborah. "New tech space HackLab.TO prepares to welcome public | Metro Toronto." Metro. April 10, 2015. Accessed April 11, 2017. http://www.metronews.ca/news/toronto/2015/04/10/new-tech-space-hacklab-to-prepares-to-welcome-public.html.

Herscher, Andrew. *The Unreal Estate Guide to Detroit*. Ann Arbor: University of Michigan Press, 2012.

Hicks, John Richard. *Capital and Growth*. London: Oxford University Press, 1965.

Hirshberg, Peter, Dale Dougherty, and Marcia Kadanoff. "Maker City: A Practical Guide for Reinventing Our Cities." Maker City. https://makercitybook.com/chapter-1-introduction-c781f7e43524#.qzx6w22ma.

"History: Building a world-changer." University of Waterloo. June 17, 2014. https://uwaterloo.ca/about/who-we-are/history.

"Holacracy: A Complete System For Self-Organization." Holacracy. http://www.holacracy.org/.

"How Ontario Lost 300,000 Manufacturing Jobs (and Why Most Aren't Coming Back)." Mowat Centre: Ontario's Voice on Public Policy. https://mowatcentre.ca/how-ontario-lost-300000-manufacturing-jobs/.

Howkins, John. *The Creative Economy: How People Make Money From Ideas*. London: Penguin Books, 2013.

Inam, Aseem. *Designing Urban Transformation*. New York: Routledge, 2014.

Jacobs, Jane. *The Death and Life of Great American Cities*. New York: Vintage Books, A division of Random House, Inc., 2011.s

Kia Kokalitcheva, Kia. "Here's Why Uber Is Building Its Own Driverless Cars." Fortune. June 14, 2016. http://fortune.com/2016/06/14/uber-driverless-cars-holden/.

Kriedte, Peter, Hans Medick, and Jürgen Schlumbohm. *Industrialization before industrialization: rural industry in the genesis of capitalism*. Cambridge: Cambridge University Press, 1981.

Landes, David S. *The Unbound Prometheus: Technological Change and Industrial Development in Western Europe from 1750 to the Present*. Cambridge, UK: Cambridge University Press, 2003.

Lazzarato, Maurizio. "Immaterial Labour." In *Radical Thought in Italy: A Potential Politics*, edited by Paolo Virno, by Michael Hardt. Minneapolis, MN: University of Minnesota Press, 1996.

Lazzarato, Maurizio and S. Murphy, Timothy. 2007. "Strategies of the Political Entrepreneur". *Substance* 36 (1).University of Wisconsin Press: 86–97. http://www.jstor.org/stable/4152855.

Lefebvre, Henri. *The Production of Space*. Oxford, OX, UK: Blackwell, 1991.

Lefebvre, Henri. *The Urban Revolution*. Minneapolis: University of Minnesota Press, 2003.

Lydon, Mike, Anthony Garcia, and Andrés Duany. *Tactical Urbanism: Short-Term Action for Long-Term Change*. Washington (D.C.): Island Press, 2015.

Lynch, Pat. "Why Toronto and Waterloo Are Hooking Up." Huffington Post. November 30, 2013. http://www.huffingtonpost.ca/pat-d-lynch/live-work-cluster_b_4360995.html.

Mackay, Robin, and Armen Avanessian. *#Accelerate: The Accelerationist Reader*. Falmouth, United Kingdom: Urbanomic Media, 2014.

"Maker Expo 2015." Maker Expo. http://www.makerexpo.ca/past-expos/maker-expo-2015/.

Marx, Karl. *Grundrisse: Foundations of the Critique of Political Economy*. Translated by Martin Nicolaus. New York: Vintage Books, 1973.

Marx, Karl. *Capital, Volume I*. Translated by Ben Fowkes. London: Penguin Books, 1990 [1867].

Maurya, Ash. "Lean Canvas." LeanStack. https://leanstack.com/leancanvas.

Mendels, Franklin F. . "Proto-industrialization: The First Phase of the Industrialization Process." *The Journal of Economic History* 32, no. 1 (March 1972): 241-61. http://www.jstor.org/stable/2117187?seq=1&cid=pdf-reference#page_scan_tab_contents.

Miller, Matthew. "Hacklab.to is Moving." Indiegogo. September 06, 2013. Accessed April 11, 2017. https://www.indiegogo.com/projects/hacklab-to-is-moving#/.

Morgan, Jacob. "The Complete Guide To The 5 Types Of Organizational Structures For The Future Of Work." Forbes. July 22, 2015. https://www.forbes.com/sites/jacobmorgan/2015/07/22/the-complete-guide-5-types-of-organizational-structures-for-the-future-of-work/#47ffd9be7705.

Moyer, Bill. *Kitchener Yesterday Revisited An Illustrated History*. Kitchener: Kitchener Chamber of Commerce, 1979.

Negri, Antonio. *The Politics of Subversion: A Manifesto for the Twenty-First Century*. Translated by James Newell. Cambridge: Polity Press, 2010.

"NightShift." NightShift. http://nightshiftwr.ca.

O'Brien, Chris. "Inside the $250M Uber is Spending on its New San Francisco and Oakland Offices." VentureBeat. March 02, 2016. Accessed April 14, 2017. https://venturebeat.com/2016/03/02/inside-the-250m-uber-is-spending-on-its-new-san-francisco-and-oakland-offices/.

O'Flanagan, Rob. "10 Carden to Buy 42 Carden." GuelphToday. February 27, 2016. Accessed April 11, 2017. https://www.guelphtoday.com/local-news/10-carden-to-buy-42-carden-202498.

Osterwalder, Alexander. "Business Model Canvas." Strategyzer. https://strategyzer.com/canvas/business-model-canvas.

Overmeyer, Klaus, ed. *Urban Pioneers: Temporary Use and Urban Development in Berlin*. Berlin: Jovis, 2007.

Petrova, Yana, and Yu-Hsiang Hung. "Laboratory." Projective Cities. http://projectivecities.aaschool.ac.uk/portfolio/laboratories/.

Piketty, Thomas. *Capital in the Twenty-First Century*. Translated by Arthur Goldhammer. Cambridge, MA: Harvard University Press, 2014.

Porter, Catherine. "A new model of community centre building: Porter." Thestar.com. October 28, 2014. Accessed April 11, 2017. https://www.thestar.com/news/world/2014/10/28/a_new_model_of_community_centre_building_porter.html#.

Porter, Michael E. "Location, Competition, And Economic Development: Local Clusters In A Global Economy." *Economic Development Quarterly* 14, no. 1 (February 1, 2000): 15-34.

Ramljak, Suzanne. "Richard Sennett on Making." American Craft 69, no. 5 (October 2009): 46-49. Art Full Text (H.W. Wilson), EBSCOhost.

Richardson, Mark, Susie Elliot, and Brad Haylock. "This Home Is a Factory: Implications of the Maker Movement on Urban Environments." *Craft Plus Design Enquiry* 6 (January 2013): 141-53.

Ries, Eric. *The Lean Startup: How Today's Entrepreneurs use Continuous Innovation to Create Radically Successful Businesses*. New York: Crown Business, 2014.

Rigour: How to Create World Changing Spaces. 2010. http://socialinnovation.ca/sites/default/files/sssi/Rigour_How_to_create_World-Changing_Shared_Spaces.pdf.

Rifkin, Jeremy. *The Age of Access: The New Culture of Hypercapitalism, Where All of Life Is a Paid-for Experience*. New York: J.P. Tarcher/Putnam, 2000.

Rowell, Marg, Ed Devitt, and Pat McKegney. *An Illustrated History of Waterloo, Ontario in celebration of its 125th anniversary, 1857-1982*. Waterloo, ON, 1982.

"Seed Grants." Ontario Trillium Foundation. http://www.otf.ca/what-we-fund/investment-streams/seed-grants?redirected=1.

Sennett, Richard. "The Architecture of Cooperation." Lecture, Richard Sennett, "The Architecture of Cooperation", Harvard Graduate School of Design, Boston. February 28, 2012. http://archinect.com/lian/live-blog-richard-sennett-the-architecture-of-cooperation.

Staebler, Edna. *The Story of Kitchener*. Kitchener: Kitchener Waterloo Record, 1962.

Standing, Guy. *The Precariat: The New Dangerous Class*. London: Bloomsbury, 2016.

Surman, Tonya. "We're at it again! CSI is buying a new building in Downtown Toronto!" Centre for Social Innovation. Accessed April 11, 2017. http://socialinnovation.ca/blog/we%E2%80%99re-it-again-csi-buying-new-building-downtown-toronto.

Tiessen, Paul. *Berlin, Canada: A Self-Portrait of Kitchener, Ontario before World War One*. St. Jacobs, Ont.: Sand Hills Books, 1979.

Uttley, William Velores. *A History of Kitchener, Ontario*. Waterloo: Wilfrid Laurier University Press, 1975.

Walker, David F., and Elizabeth Bloomfield. *Manufacturing in Kitchener-Waterloo: A Long-Term Perspective*. Waterloo, ON: Dept. of Geography, University of Waterloo, 1987.

Weber, Max. "The Nature of the City." In *Classic Essays on the Culture of Cities*, edited by Richard Sennett. Englewood Cliffs, NJ: Prentice Hall, 1969.

"What Is a Fab Lab?" Fab Foundation. http://fabfoundation.org/fab-labs/what-is-a-fab-lab/.

"What is a Worker Co-op?" Canadian Worker Co-op Federation. http://canadianworker.coop/.

"What is Private Debt?" CNL Securities. http://www.cnlsecurities.com/advisor-resources/2022-what-is-private-debta.stml.

Williams, Alex, and Nick Srnicek. "#Accelerate: Manifesto for Accelerationist Politics." In *#Accelerate: The Accelerationist Reader*. Falmouth, UK: Urbanomic Media.

Wingfield, Alexandra Alter and Nick. "A Trip Through Amazon's First Physical Store." The New York Times. March 10, 2016. https://www.nytimes.com/2016/03/12/business/media/a-virtual-trip-through-amazons-physical-store.html?_r=1.

APPENDIX- DIY Guidebook

This appendix is a guidebook for the do-it-yourself creation of community hackerspaces, collectives and hubs.

The file name of this guidebook is “DIY- Hackerspaces, Collectives and Hubs.pdf”.

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