Re-activating Farmland in Ottawa's Greenbelt:

Establishing a Concept of Infrastructure Development in the Southern Farm Sector

by

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A thesis submitted to the Faculty of Graduate and Postdoctoral
Affairs in partial fulfillment of the requirements
for the degree of

Master

in

Architecture

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Ottawa, Ontario

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ABSTRACT

Established by the Greber Plan in 1950, the objective of Ottawa's Greenbelt was to create a federally owned green space that would contain the urban sprawl of the city. At the time of expropriation, the land mass that is now considered "the Greenbelt" was actively used for agriculture.

Sixty-four years later, the population of Ottawa has outgrown its original boundaries and the Greenbelt has effectively become a transit corridor for the city's urban and suburban populations. The greenbelt is farmed less and less with each passing year and more questions arise as to its role within the city.

This thesis explores the kinds of infrastructure that could be developed to reactivate Ottawa's Greenbelt. It includes a design proposal for the Southern Farm Sector that envisions a productive agricultural landscape focused on the production of locally grown food, public engagement and education, and sustainable development.

figure 1. Farmhouse in the west end of Ottawa's Greenbelt after being damaged by fire

figure 2. Dilapidated barn after heavy snow loads caused the roof to collapse

figure 3. Typical exterior barn condition

figure 4. Drastic example of an abandoned farmhouse interior takeover after being taken over by squatters

Acknowledgements

To Mom and Dad- thank you for loving me more than words can say. You have always provided me with endless opportunities to explore my imagination, I am so grateful to have both of you as my parents. Marc, Adele, Roman and Kirsten- thank you for all your love and support.

To Jenn and Gerry, for being the seed of this creative journey. For all the encouragement, resources and tools along the way. I can't imagine my life without either of you in it.

To my friends, the most wonderfully eclectic group of individuals I hold so dear to my heart. Thank you for all your love and support.

To Professor Lucie Fontein, thank you for your undivided patience and support throughout the writing of this thesis. I am infinitely grateful to you for your feedback and attention you've so generously given me. I feel very fortunate to have had you as a supervisor.

Andre Viljoen, author of *Continuously Productive Landscape* (2010)

“Food contributes around one quarter of our ecological footprint. It can therefore be a significant factor in the development of sustainable communities. As planners, architects and developers, we can consider how to facilitate more healthy and sustainable diets. On a regional scale, we have the opportunity to re-invest the relationship between urban areas and their rural hinterland to increase the availability of local, organic and seasonal food- so called “bioregionalism”. We can also consider master planning to promote urban agriculture, farmer’s markets and more allotment space, and consider community centers as drop off points for local food. To increase happiness and increase sustainability we should grow more of our own food. We should integrate herb boxes, sky gardens, community gardens, allotments, rooftop mini-allotments and edible landscaping into our architecture.” (Viljoen, CPUL- p.49)

TABLE OF CONTENTS

Abstract	i
Acknowledgements	iii
Prologue	p.1
<hr/>	
CHAPTER ONE- Site Context	
1.0 Introduction	p.2
1.1 Understanding the Greenbelt Ideology	p.3
1.2 Establishment of Ottawa and the implementation of ‘the Greber Plan’	p.4
1.3 Creation of ‘The Greenbelt’	p.5
1.4 Failures of the Greenbelt	p.5
1.5 The Current Condition of Ottawa’s Greenbelt	p.7
1.6 Reasons for deteriorating of Agricultural Infrastructure	p.9
1.7 Advantages of Greenbelt Land Use	p.10
1.8 Thesis Question	p.11
1.9 References	p.12
<hr/>	
CHAPTER TWO- Agricultural Context	
2.0 Introduction	p.13
2.1 Overview of the current Canadian agricultural landscape	p.13-14
2.1.A- Fewer, but larger establishments	p.15
2.1.B- The Impact of Free Trade on Canadian Farms	p.16
2.1.C. Increased Cost of Farmland	p.16
2.1.D Aging Population	p.17
2.2 Possible Futures for the Canadian Agricultural Landscape	p.17-18
2.3 Alternative Methods of Farming	p.18
<hr/>	
CHAPTER THREE- Case Studies	
3.0 Introduction	p.21
3.1 Case Study 1- Souther Farm Development Plan	p.23
3.2 Case Study 2- Ottawa “Just Foods”	p.23
3.3 CPUL- R-Urban, Paris, France	p.25-27
3.4 Four Fields	p.28-29
3.5 References	p.30
<hr/>	
CHAPTER FOUR- Design	
4.0 Introduction.	p.34
4.1 Defining design criteria	p.34
4.2 Site Selection	p.35
4.3 Determining Architectural program	p.36
4.4 Creating a Link	p.44
4.5 Defining a Major Design Component	p.44
4.6 Continuing the Path	p.52
4.7 A note on materiality	p.56
4.8 Conclusion	p.57
<hr/>	
CHAPTER FIVE- Conclusion	
5.0 Conclusion	p.58

PROLOGUE

At the very beginning of my journey in architecture, I worked two consecutive summers for the Heritage Department of the National Capital Commission (NCC) in Ottawa, Ontario. My role was to document the NCC's existing assets in Ottawa's Greenbelt, as they are the land holders for this federally owned land. My task was to submit files of their existing farm infrastructure to the Federal Heritage Building Review Board (FHBRO) under Parks Canada. Based on these submissions, the review board was to evaluate the heritage status of barns, farmhouses and outbuildings. Since the majority of these buildings have been abandoned or were left unused for long periods of time after they were expropriated in 1965, very few of them ever received heritage status.

The NCC works hard to maintain the land with the available resources given to them. However, the lack of public engagement and interest in the Greenbelt makes it difficult for the organization to vouch for the significance and financial upkeep of the buildings. The unfortunate result is often that the buildings fall into disrepair and are eventually demolished.

Although there has there been a gradual loss in agricultural infrastructure since the time of expropriation, the bulk of the land remains designated as agricultural farmland for the use of the public. As written in their most current masterplan in 2012, the NCC, continues to aspire to reaching an ideal of greater agricultural production in the Greenbelt.

This thesis seeks to uncover the possibility of what this could look like.

**It is important to note that although the NCC was made aware of this project, they, in no way, endorse or are partners in this thesis. All research attempts to reflect an accurate representation of Ottawa's Greenbelt and was done through consulting public records and information.*

figure 1-1. Growing population of Ottawa. (NCC 2010)

CHAPTER ONE- *SITE CONTEXT*

Approaching Ottawa's Greenbelt as a Land Mass Within the City

Introduction

It is difficult to ignore the presence of Ottawa's greenbelt. Approximately 33% of our population, residents of the surrounding suburbs of Kanata, Barrhaven and Orleans, drives directly through the greenbelt on their daily commute.¹ Given that by 2011, 88% of Ottawa's residents lived in auto suburbs, transit suburbs or exurban areas, and an additional 55% may intersect the Greenbelt at some point in their day (Cook, 2012). When asked of this land's purpose, however, many citizens are ignorant about the Greenbelt's role in the city. Are farmer's using the land? Why hasn't it been developed for housing or industry? We are left scratching our heads. Ottawa's growing population increases the urgency to clarify the potential of the Greenbelt: its uses and functions, as well as its role in the future of Ottawa's development.

This first chapter explores the concept of greenbelts, and the way it has shaped the city of Ottawa through the implementation of the 'Greber Plan', and the failures and realities of the land since expropriation. Specifically, it identifies reasons for the deterioration of the infrastructure, and the advantages and disadvantages of becoming a tenant farmer on the land. Finally, it establishes a context in which to evaluate types of infrastructure development and the ways in which active community engagement with the Greenbelt might take place.

1. A new national study shows that although Canada is routinely described as an urban nation, 67 percent of us, or 22.4 million people actually live in suburban neighbourhoods...In the city of Ottawa in 2012: 528,900 people lived inside the greenbelt and 406,100 lived outside it - with 96% of growth in the suburbs. (Cook, 2012)

1.1 Understanding the Greenbelt Ideology

The concept of a 'Greenbelt' dates back to 1580 when the Queen of England, Elizabeth I, declared, "a city of great multitudes needs restrictions to prevent crowded housing and great poverty" (Mandelker, 27). It wasn't until the 19th century, however, that a more refined concept- the 'garden-city' caught the public's imagination. The concept "was a reaction to the ugliness of the industrial revolution, which has separated the Englishman from the countryside and had crowded him into drab and teeming cities" (Mandelker- p.28). The main objectives of typical 'garden-city' plans were to i) maintain a balance between town and country ii) protect agricultural land iii) regulate city growth² and iv) ensure the furtherance of local government policy. (Mandelker, p.32-35)

The problems and realities of the 16th and 19th century city are entirely different from those we are presented with in 2013. For instance, lifestyles were not dependent on any of the machines we currently rely on, and public services were not available in the same basic capacities we now take for granted. In the late 19th century, innovations such as the automobile, plumbing, and electricity, were introduced; but while these were prevalent in the homes of the rich, they were not yet part of the lifestyle of the common man. Priorities and daily routines differed greatly between the rich and poor. Cities were often seen as dirty due to pollutants from local industry, family farms were a significant part of the economy, and there was a divide between the city and the country. The concept of 'suburbs' did not yet exist.

figure 1-2. City of Ottawa, Photograph. Greber Plan . 1950

figure 1-3. Greber Plan Masterplan (Plate 8) 1950

However, drastic changes were on their way. With the end of the industrial revolution (1760-1840) and the coinciding rise of the middle class, priorities and lifestyles began changing into ones that we would better recognize today.

1.2 Establishment of Ottawa, the Federal District Commission (FDC) the National Capital Commission (NCC) and implementation of 'The Greber Plan'

Queen Victoria chose Ottawa as Canada's capital in 1857. Ottawa, was chosen to be the nation's capital because of its proximity to the river and its location halfway between Toronto and Quebec City. Its landscape, was representative of most other rural cities in the country at that time- largely populated by farmers' fields. Its industry relied heavily on the lumber trade, but this would soon change with the establishment of the federal government and its demand for public servants.

After the construction of the Parliament buildings, and the permanent establishment of the city, the Federal District Commission (FDC) was created in 1927, later replaced by the National Capital Commission (NCC) in 1959. The Commission was created in the hopes of establishing a political party that would represent the interests of Ottawa as the nation's capital. The NCC's mandate, which has remained relatively unchanged for the past 50 years, has been to 'provide a source of pride and inspiration for all Canadians.' (NCC, 2011)

In 1950, the Greber Plan was submitted to the FDC and was implemented shortly afterwards. The goals of the Greber Plan were similar to other "garden-

city” development plans created during that time; to 1) relocate the railway network and heavy industry outside of the city’s core; 2) reorganize the road network and create a scenic parkway; 3) create a rural belt, the Greenbelt, to contain urban growth; 4) create a network of parks, green spaces, pathways and open spaces, and 5) establish a decentralization of government buildings with the creation of four nodes to accommodate research and administration (Tunneys Pasture, Booth Street Complex, Confederation Heights, RCMP and Montreal Road Complex). (NCC, 2011)

1.3 Creation of ‘The Greenbelt’

Although all five of these recommended strategies have been implemented in Ottawa, and have taken on their own shapes, the focus of this thesis is on the third initiative of the Greber Plan- the creation of the Greenbelt. Moving forward it is this strategy that holds the most potential for improvement and re-evaluation. The land mass was expropriated between 1958 and 1966 at a total cost of \$40 million and occupies an area of approximately 16,600 hectares. Approximately 83% of the original Greenbelt area was privately owned, in varying degrees, by approximately 1000 owners. Of these, some 600 were agricultural producers: dairy farmers, poultry producers and market gardeners. (Nixey p.5)

1.4 Failures of the Greenbelt

Jacques Greber, the author of the Greber Plan, was a city planner rooted in the history of his time. His ‘Greber Plan’ for the city of Ottawa, has a significant focus on neighbourhood analysis and current population demographics. However, his analysis failed to consider three significant and emerging societal changes at that time: firstly, Greber did not properly

2. A maximum city population of 500,000 people is often cited as a city’s population limit

project the growth of the middle class and its demands as consumers. Baby boomers and the generations following them have been mostly interested in large homes on affordable land. This interest resulted in an influx of people building homes on the exterior boundary of the greenbelt. These communities eventually became the suburbs of Kanata, Barrhaven and Orleans. In 2001, these suburbs were amalgamated into the city of Ottawa, officially transforming the greenbelt from the city limit to an ‘in-between’ zone of the city.

Secondly, Greber failed to evaluate the role of the automobile in our future lifestyles, thus failing to see the ability and convenience of ‘hoping the greenbelt’ in order to get to other parts of the city. Thirdly, Greber did not foresee proper population projections for the city. Figure 1 illustrates Greber’s population projections for 2020.

Within the greenbelt itself, the agricultural land has continued to deteriorate. Before expropriation in 1961, 71% of the greenbelt (10,900 hectares of the 15,200 ha total) was used for farming, the majority being used for intensive livestock production (MacNabb, 1967). Included in this area were approximately 40 ha in market gardens, mostly in the Renaud Road area. The land was also used for horse ranches, poultry farms, apiaries and orchards at the time. By 1969, the area being farmed in the Greenbelt dropped to approximately 6100ha. By 1972, this figure was closer to 4900ha because of transfers to other uses or area that had lost its agricultural potential (Nixey, p.5-6). As of 1993 report, there are 85 farm leases in the Greenbelt.

Today, some of these farms continue to be operated under what the NCC considers, ‘long-term land leases’. These leases have typically been given to families remaining as tenants on the land after expropriation. The number

figure 1-4. Greber's population projection, overlaid with actual population size for 2011

of these long-term land leases, however, are dwindling. Sixty-years after its inception, the city of Ottawa continues to be shaped by the Greenbelt. This is despite the fact that the original intentions for the land have not been fulfilled. It has not ‘prevented urban sprawl’ and the agricultural land is continuing to deteriorate.

1.5 The Current Condition of Ottawa’s Greenbelt

Every year fewer and fewer farms are in operation in the Greenbelt. The following figures are of Ottawa’s Greenbelt in its current condition (2013). The demolished farm sites represent infrastructure, mostly barns, which were on the land when expropriated in 1965-66. All imagery analysis for the figures was retrieved from the City of Ottawa archives (Geo Ottawa) and the analysis was done by comparing photographs from 1965 to 2011. This data represents the most current and accurate, state of the greenbelt.

With no new infrastructure being built and little maintenance being done on the buildings that do still exist- the Greenbelt is shifting from a once productive space that reflected the history of our land to an increasingly underutilized area of the city. This trend is particularly serious in the eastern part of the greenbelt.

“The farm buildings in the western farm zone are a combination of the original buildings purchased by the NCC and some new ones that have been added as replacements to accommodate tenant needs. A number of older facilities have undergone recent improvements. While some barns still appear to require repairs to the roof, siding or foundation, the buildings are generally adequate for the type and scale of operations being carried out by the tenants. Farm buildings in the eastern zone are, in general, not in as good a condition as those in the west. Approximately one half of the houses and three quarters of the farm buildings are in need of repairs and maintenance. (Nixey, p.28)

figure 1-5. Overview of Greenbelt with sections determined for analysis

This trend is reflected in the analysis of zone 5 of the greenbelt (the eastern part of the greenbelt) - with the highest percentage of farms being lost, 31 farms/ pieces of infrastructure having been demolished since expropriation, and the most successful ones being in the south western zones of the greenbelt.

figure 1-6. Zone 5 of Ottawa’s Greenbelt, showing the highest number of lost infrastructure

figure 1-8. Resulting maps of Ottawa's Greenbelt analysis from GeoOttawa imagery

1.6 Reasons for deterioration of Agricultural Infrastructure

Why is there such a significant loss in agricultural infrastructure? The land is viable for farming (as it has been for the past 200 years), the landowners (NCC) are willing to rent the land, and, as will be discussed in the following chapter, there is currently a demand for local produce. So why have all these farms gone without tenants, maintenance, and consequently, why have they arrived at a point where demolition is the only suitable course of action?

Nixey's Agricultural Analysis of the Greenbelt identifies the following key factors that explain why there is a lack of interest in using the greenbelt for its designated purpose. Firstly, the leasing policy between the NCC and the tenants is highly bureaucratic. Anything over a five-year land lease requires a lengthy submission to the Treasury Board of Canada. This creates problems related to a tenants investments in setting up the infrastructure and obtaining the collateral necessary to start a farm. Secondly, maintenance or upkeep on the buildings is repayable in the form of rent back to the NCC (Nixey, p.29). A farmer must therefore be willing to rent a piece of land and pay for basic upkeep of his or her rented property. Thirdly, farmers are not eligible for provincial farmland tax rebates because they do not own the land. Finally, there is little incentive for building upkeep and tenants are unable to build equity (Nixey, p.41-42)

These disadvantages are magnified even further. Currently, the NCC's only model of food production is through independent leases, placing the responsibility largely on the farmer. The land and infrastructure could be better used if it were made accessible to the public. In the NCC's

greenbelt masterplan, the organization emphasizes the importance of public engagement with the land. They state:

“The Greenbelt of Canada’s Capital is a unique place. These 21,500 hectares within Canada’s Capital Region (CCR) belongs to the people of Canada. The Greenbelt is the most ecologically diverse natural landscape within an urban area. The greenbelt supports a viable base of prime agricultural lands that in close proximity to a large urban population. It is also a myriad of places and experiences for recreation that provide solitude, observation of nature, the opportunity for many forms of exercise, glimpses into the experiences of our ancestors or connection with our local food system” (NCC, Greenbelt Masterplan (p.5), 2012)

It is time to develop infrastructure with public use in mind, with the intention of introducing the public to agricultural practices, our cultural heritage, and the outdoors (and related activities). Otherwise, these small-scale farms will continue to depreciate in value and eventually disappear.

1.7 - Advantages to Greenbelt Land Use

There are special circumstances to farming in the Greenbelt that can be seen as advantageous. First, the shape and location of the Greenbelt is unique. Despite the growth of the city, the greenbelt has stayed virtually untouched for more than 60 years, and it now benefits from the proximity to both urban and suburban populations. This puts farmers in direct proximity to potential markets with an easily accessible off-site labour force. Secondly, with the option to rent the land, rather than purchase it, there are lower start-up, expansion and maintenance costs. Thirdly, zoned as agricultural land and used that way in the past, a majority of the land is in excellent condition for farming.

1.8 Thesis Question

Given the special circumstances in which the Greenbelt exists in the city of Ottawa, *What kind of infrastructure can be developed in Ottawa's Greenbelt that will help to reactivate the land into a productive agricultural landscape?*

A possible solution will be tested through the design of a proposal for the Southern farm District of the Greenbelt. It will be evaluated based on its perceived potential as an educational tool and perceived ability to engage the public in agricultural activities. More specifically, the project will (1) address the space of the greenbelt as an opportunity for community development and education of both our agricultural land and heritage; (2) maintain its objective of preserving agricultural land- as historically relevant, as well as an opportunity to address the growing demand of locally grown food; (3) address both the five- year leasing policy and the need for upkeep and deteriorating existing infrastructure; and (4) captivate its audience and provide a unique vision for the greenbelt to, once again, become a productive landscape.

Chapter 1 References:

Cook, Maria. "Canada's new identity: A suburban nation, two-thirds of Canadians live in the suburbs, study find" www.ottawacitizen.com. Ottawa Citizen, 6 Sept. 2012. Web. 04 Nov. 2013

Greber, Jacques - Plan for the National Capital, General Report Submitted to the National Capital Planning Committee. (1950)

Herington, John "Beyond Green Belts: Managing Urban Growth in the 21st Century". Jessica Kingsley Publishers. London (1990)

MacNabb, B.B. The National Capital Greenbelt. Research paper presented to the Division of Town and Regional Planning, University of Toronto (M.Sc. Thesis) Toronto, Ontario (1967)

Mandelker, Daniel R. Green belts and urban Growth (English Town and country planning in Action) The University Washington Press (1966)

National Capital Commission, Horizon 2067: The Plan For Canada's Capital- Charting The Future of Canada's Capital in the 21st Century – Step 1- Foundation Paper (August 2011)

Senes Consultants Limited prepared for the National Capital Commission, Greenbelt Masterplan Review, Phase 1- Step C: Land Use Concept (January 2012)

Nixey, Daniel: The Future Greenbelt- Agricultural Analysis, Prepared for: The National Capital Commission Long Range Planning Division (November 1991)

Osborn, Frederic J. "Green-Belt Cities" Schocken Books. New York (1969)

CHAPTER TWO- AGRICULTURAL CONTEXT

The Canadian Agricultural Landscape of the 21st century

2.0 Introduction

Since the objective of this thesis is to propose a way to reactivate the agricultural infrastructure of Ottawa's Greenbelt, it is relevant to look at the broader national state of agriculture in Canada. This chapter discusses the current state of farming in Canada, the resulting impact on Canadian farms, and alternate methods of farming for the future of agriculture.

2.1 Overview of the Current Canadian Agricultural Landscape

As with the societal shifts brought on by the industrial revolution in the 'garden-city movement,' mass manufacturing coupled with the signing of the North American Free Trade Agreement (NAFTA) in 1994 made a significant and profound impression on farming in Canada. Our local farms were opened to an international marketplace. Monocrops have become the most efficient and lucrative form of farming, making mixed-crop farms less desirable. According to Agriculture Canada,

"The real value of production has tripled over the last 45 years while the numbers of farms have been halved". -Agriculture Canada (2006)

The shift to monocrops has led to the consolidation of the agri-food business. Four major trends have emerged in relation to Canada's current state of farming. Firstly, there are now fewer, but larger farming establishments in Canada. Next, due to the effects of free trade and the emergence of new economies, Canadian farmers aren't able to keep up with low cost labour

forces in other countries. Thirdly, the cost of buying land and starting up a farm has gone up exponentially in recent years making it a difficult industry to enter as a new farmer, and finally, due to changes in societal attitudes and the complexity of farming in the 21st century, fewer people are interested in farming as a way of life. As a result, the current farming population is aging and numbers are shrinking.

2.1.A - Fewer, But Larger Establishments

Agricultural production is becoming more concentrated for every type of farm, especially on very large farms. Between 1961 and 2001, the number of farms in Canada declined from approximately 500,000 to 250,000. However, the rate of decrease has slowed in recent years: between 1961 and 1981 farm numbers dropped by 35%, whereas between 1981 and 2001 farms exited and entered at a rate of 3 to 4%. (Agriculture Canada) Remarkably, this has not affected production levels: “the real value of agricultural production tripled between 1961 and 2001, from about 12 billion to 35 billion. Wheat production increased by 173% between 1961 and 2001. During the same period, production of poultry increased by 273% and that of pork by 318%.” (Agriculture Canada) This trend of consolidation and efficiency continues to influence the food processing industry today.

“In 1990, there were 3,700 food processing establishments in Canada with an average value of shipment of 12 million. By 1999, the number of establishments had declined to 3,100 while the average shipment had increased to about \$20 million. The largest 5% of food manufacturing establishments accounted for over 50% of sales in 2003 whereas the smallest 80% of establishments accounted for only 15% of sales.” (Agriculture Canada (2006), Changing trends p.4)

Additionally, these processes of mechanization have drastically influenced the availability of employment and have created an hourglass production model. In 'Food Security, Michael Carolan states:

“When looked at from gene to grocery bag- that is, from the input sector all the way through to the consumer- the population of the agrifood chain takes on an hourglass figure that is precariously hanging on by a thread. Beyond the input sector, which is dominated by a handful of global giants, we find a system with significant producer and consumer populations. The hourglass shape reflects the highly truncated ‘middle where food processors and manufacturers and food and beverage retailers reside.” (Carolan (2013) p.100)

Both a monopoly and monopsony have been created in the agricultural industry as a result of this mass consolidation. The sellers get to set their prices to the farmers for seed and manufacturing equipment, and on the opposite spectrum, because of the hourglass structure, the farmers are forced into a market condition that exists when there is only one buyer. Ultimately control is taken away from the actual food producer.

figure 2-1. Michael Carolan (2013) hourglass shape model

2.1.B- The Impact of Free Trade on Canadian Farms

The second major impact on Canadian farmers has been the opening of free trade between countries. As previously noted, a large part of our economy is reliant on creating exports for distribution and sale. However, because prices are set to a world market and competition is coming from regions with low cost producers, it is increasingly difficult for Canadians to export bulk food supply.

“Bulk commodities accounted for close to one half of exports in the early 1990s. Today they constitute less than one quarter of exports. At the same time, producers within the supply management system have achieved steady productivity increases while focusing almost exclusively on the domestic market.” (Agri-food industry A discussion Paper p.4)

Furthermore, future international agreements likely will force a continued reduction in the level and types of government support that all countries, including Canada, can provide to their domestic agricultural sectors. Over time, this will reshape governments’ relationship with industry, as previous levels of government support and particular types of programming may no longer be permissible. (Agri-food industry A discussion Paper p.6)

2.1.C- Increased Cost of Farmland

Agriculture Canada states that there are a considerable number of new entrants to farming each year. However, these entrants face specific challenges in establishing their operations, particularly with regards to financing and capital investment. Entering the farm business incurs high capital costs: farm equipment, tools, and infrastructure all require a considerable investment. In addition, farmers’ crops yield different

results depending on the season, necessitating a distribution of profits over a number of years.

Opening up public farmland in Ottawa's Greenbelt addresses a number of these issues by providing an excellent opportunity for delivering education and agricultural opportunities while increasing access to interested farmers to build the collateral and skills necessary to start a farm.

2.1.D- Aging Population

According to Agriculture Canada, one third of producers are now over the age of 55. This underlines the need to educate new farmers, not only for the needs of continued production but also for cultural heritage and tradition. What better opportunity to facilitate such entry, than through the use of federally owned land that is designated "public farmland"?

2.2 Possible Futures for the Canadian Agricultural Landscape

Given the challenges outlined above, it is clear that agriculture in Canada is in a state of flux. Thus far, Canadian farms have been able to benefit from the mechanization of farming and free trade, through large economies of scale and by producing monocrops of one or two products for bulk exports. However, with increased markets, production has been changing.

According to Agriculture Canada, agriculture in the next generation should respond to the changes in the Canadian farming industry with alternative solutions that better support a long-term sustainable

agricultural framework. This provides an interesting opportunity for future infrastructure development. Agriculture Canada projects that value-added market niche products, will be most popular in the future. Some examples include: knowledge of the source of one's food, participation in the process of food production, and the direct support of a local agricultural system through consumer purchasing power.

Agriculture Canada states:

“The diversification of Canadian agriculture into more value-added products is consistent with the evolution of world markets”. Consumers are looking for more from their food. “The proliferation of processed foods and the shift to urban environments have left many consumers feeling disconnected from the source of their foods. Increased interest in “buying local” will support domestically grown products and the growth of farmer's markets. (Agri-food industry A discussion Paper p.6)”

2.3 Alternative Methods of Farming

In Ottawa, the local food movement is supporting an increasing demand for community supported agriculture (CSA). Community supported agriculture is an alternative, locally-based economic model of food distribution that relies on stakeholders who pledge to share in the risks and benefits of one or more particular farms. Typically, the relationship is that a stakeholder buys a “share” of the farmer's produce in the spring, and every week the shareholders receive a ‘basket’ of food in return. Additionally, the farmers sell their food at local farmers’ markets.

Farms often have staff or volunteers who are often individuals looking to be educated in the main principles of planting, growing and harvesting. This community supported agriculture model is gaining considerable momentum and constitutes a real programmatic possibility for a reimagined Greenbelt.

2.4 Conclusion

Due to changes of farming practices in the last two decades and the uncertainty of future practices, farmers in Canada are presented with an opportunity for change.

The infrastructure program being developed in this thesis responds to these more recent trends in agriculture in Canada, providing opportunities for supporting alternative methods of production and the growing need for community supported agriculture. Since Ottawa's greenbelt is public farmland expropriated for the 'public good' it is an ideal environment in which to test the development of public infrastructure that can help to support farming education.

Chapter 2 References:

- Agriculture and Agri-Food Canada “Next Generation of Agriculture and Agri-food industry A discussion Paper: The Canadian Agriculture and Agri-food industry” (2006)
- Agriculture and Agri-Food Canada “Renewal: Capturing opportunities through skills and knowledge: a discussion paper” (2006)
- Agriculture and Agri-Food Canada “Changing Trends in the agri-food chain “ (November 2006)
- Agriculture and Agri-Food Canada “Opportunities for Canadian Farmers: Innovation and the Bioeconomy” (November 2006)
- Agriculture and Agri-Food Canada “Changing Structure of Primary Agriculture” (November 2006)
- Agriculture and Agri-Food Canada Environmental Sustainability of Canadian Agriculture Agri-Environmental Indicator Report Series, Report #2 (2005)
- Carolan, Michael S. “Reclaiming Food Security” Routledge. 2013
- Carolan, Michael S. “The Sociology of Food and Agriculture” Routledge. 2012
- OECD “Agricultural Market Impacts of Future Growth in Production of Biofuels” (2006)
- Paine, Cecelia. Southern Farm Sector Development Plan: prepared for the National Capital Commission. (Oct.1988)
- Reeds, Jon “Smart growth, from sprawl to sustainability” Green Books. 2011
- Viljoen, Andre “CPULs, Continuously Productive Urban Landscapes: Designing Urban Agriculture for Sustainable Cities” Architectural Press. 2005

CHAPTER THREE-

Case studies- uncovering a program and relevant architectural language for re-activating Ottawa's Greenbelt

3.0 Introduction

Supporting local food systems through education and leadership is a viable architectural program for Ottawa's Greenbelt. This chapter investigates precedents that are relevant to creating a successful agricultural experience and opportunities for the residents of Ottawa while allowing them to take part in the development of a local food system. The proposed project is a place where people are encouraged, and given access to various levels of agricultural experiences, regardless of their exposure to farming and their physical abilities.

This chapter investigates four case studies, all of which are intended to help support local food systems and/or agriculture. Starting with the largest scale proposal, Cecelia Paine's "Southern Farm Sector Development Plan," identifies an appropriate site for this thesis project within Ottawa's Greenbelt. Focusing on an existing site in the Greenbelt, the second case study investigates a form of Community Supported Agriculture (CSA) in Ottawa, as seen through the local agricultural food program 'Just Foods Ottawa'. The third case study, through the perspective of R-Urban in Paris, France looks at a more contemporary and integrated sustainable infrastructure and food production system, often referred to as a CPUL (continuously productive Urban Landscape). Finally, the last case study takes a closer look at an existing and successful architectural project that has been designed with agriculture and land organization as its primary function: L'OEUF's project 'Four Fields'.

figure 3-1 Case Study 1: Cecelia Paine's Southern Farm District Zone

figure 3-2 Case Study 2: Just Foods Ottawa (a current community oriented agricultural program) in Ottawa's Greenbelt

figure 3-3. Case Study 3: CPUL, as seen through R-Urban, Paris- France

figure 3-4. Case Study 4: "Four Fields" project by L'Oeuf Architects

3.1 Case Study 1- (Local Context): Southern Farm Development Plan study

The Southern Farm Development Plan was prepared by Cecelia Paine (landscape architect) for the NCC in 1988 and it is a particularly relevant precedent since its intentions were also to enhance the presence of Ottawa's greenbelt. The Southern Farm Development area, was selected because "it incorporates the largest contiguous block of good agricultural soils within the Greenbelt. Most of the land consists of high, flat plain situated on either side of the Rideau River, with soils that are highly productive". (Paine, p.2)

The concept for this plan was based on the idea of 1) maintaining the existing diversity of family farms, which have continued to operate since the time of expropriation, 2) provide additional visitor attraction sites 3) developing recreational pathways which allow for visitors to easily move between various areas of the site, and 4) incorporating a wide range of opportunities for visitors. Figure 3.2 shows the existing condition of the Southern Farm Sector, and Figure 3.3 shows Paine's proposed condition of the Southern Farm Sector.

figure 3-5. Southern Farm Development Plan simplified SITE PLAN. Original Document in Appendix

figure 3-6. Southern Farm Development Plan simplified CONCEPT PLAN. Original Document in Appendix

Evaluation:

Given that Paine is a landscape architect, the report focuses on large land-use issues and in doing so, identifies key zones within the Southern Farm Sector that would benefit from future development. This is extremely helpful in understanding the hierarchy of programs on the site. Her top priority is to maintain the existing farms, and then to bring further attention to these sites by proposing additional recreational and commercial facilities and pathways.

The discovery of Paine's research also falls in line with my own findings done through the analysis of Geo Ottawa's imagery; this section of the greenbelt remains to be the most active and viable area of farming in the greenbelt, from 1988 (when Paine's study was completed) to today in 2014. Currently, only one site, from the initial 10 sites evaluated in the site analysis has been demolished. This undoubtedly means that Paine's understanding of the greenbelt continues to be relevant, and as such it will be the selected area of study for implementing an architectural program.

3.2 Case Study 2- Ottawa: “Just Foods”

Just Foods Ottawa presents a particularly relevant case study of innovative farm practices in Ottawa’s Greenbelt. Just Foods is a not-for-profit organization that is attempting to implement and develop strategies that create more access and opportunities for buying and selling locally produced food.

As part of their mandate, Just Foods has recently created an incubator farm in the National Capital’s Greenbelt area. The facility includes a farmhouse, which is retrofitted as offices for the Just Foods staff, and a storage barn with around 60 acres of land surrounding the infrastructure. The goal of the incubator farm is to create opportunity for people interested in agriculture but who lack the means to buy land.

The incubator farm teaches and supports start-up farmers by allotting each of them a $\frac{1}{4}$ acre plot in which they can produce vegetables and fruit for either Community Supported Agriculture or for sale at Local Farmer’s markets. In return, Just Foods provides a communal wash station and cooler for sorting and temporarily storing the produce. They also provide basic support necessary in accessing water and electricity. In its second year of operation, this pilot project has been successful, with its initial membership of 10 going up by another 12 this coming spring (2014).

figure 3-7 Location of Just Foods within Ottawa's Greenbelt

figure 3-8 Site Plan of Just Foods' operation

In an interview with the CBC on June 23rd, 2013 entitled 'Farming Incubator's offer way in (there's a new program for people wanting to try farming without a big money investment), Steven Blight of the National Capital Commission notes that the NCC would like to transform more of its properties to farms like this. He continues, "we'd like to promote more sustainable forms of agriculture that are locally based, consumer based, and near to the consumer." This shift from producing monocrops to a more locally based niche market system falls in line with similar goals discussed in Part A that are currently mandated by agriculture Canada.

Evaluation:

In a lot of ways, Just Foods Ottawa is already successfully reactivating Ottawa's Greenbelt by introducing agricultural programming. This is illustrated by the increased enrolment for the upcoming season. The difficulty however, in discussion with Laura Benes (volunteer with one of the farms onsite) is that "Just Foods" is suffering from a similar problem other tenants of the land have had. They are unable to secure a lease longer than five years with the National Capital Commission therefore inhibiting them to truly be good stewards and to remain invested in the agricultural and architectural programming of the land.

As a result, in programming this architectural design, I believe it would be counter-intuitive to create infrastructure that has the potential to be privately owned or leased. Traditional notions of a farmstead would be irrelevant to Ottawa's Greenbelt, as what the greenbelt really needs is permanent public infrastructure.

This, of course, would put the onus completely on the NCC to own and operate a public infrastructure for use by the residents of Ottawa and by tourists. Such an idea is not beyond the scope of the NCC, as it currently owns and operates both

the Rideau Canal and the Rockcliffe parkway. Both are infrastructure projects that include buildings that require management structures. The Greenbelt needs a similar, recreational path to activate and attract people to its agricultural land.

The design project should therefore not be restricted by property lines inside the greenbelt. Ultimately, the scope and scale of the project should address the entire land mass and infrastructure.

figure 3-9 Comparing Just Foods to other successful NCC initiatives

3.3 Continuously Productive Urban Landscape- R-URBAN

The concept of a continuously productive urban landscape (CPUL) is an emerging idea that is based on creating economically, sociologically and environmentally sustainable landscapes in the urban environment.

“CPULs will be city-traversing open spaces running continuously through the built urban environments, thereby connecting all kinds of existing inner-city open spaces and relating, finally, to the surrounding rural areas. Vegetation, air, the horizon, as well as people, will be able to flow into the city and out of it. Partially, the city will become open and wild”. (Viljoen, p.11)

R-Urban is an example of a CPUL currently being implemented in the suburbs of Paris. It introduces a network of resident-run facilities to create key fields of activity. It is structured around a 5000m loop that is a recreational path that enables visitors and tourists to easily travel from one destination to another. The first key site is named ‘Agrocite,’ which is a micro experimental farm, with community gardens and educational and cultural spaces. The second major site is the ‘Recyclab” which is a recycling and green building unit constructed around a series of equipment for the recycling of urban waste. The third component is the ‘Ecoophab,’ which is a cooperative and ecological residential unit. It includes experimental housing units, including social flats, researcher/student residences and community spaces that will be partially self-built.

figure 3-10. Built 'Recyclab' in Colombes, a city located in north western suburb of Paris, France

Evaluation:

Ultimately, this case study, provided an excellent resource in terms of program development, while also acting as a reminder that in order to activate Ottawa's Greenbelt it must be grounded in the condition of Ottawa's land mass.

Like Paine's report, R-Urban reinforces the idea that a design proposal involving multiple programs is necessary to reactivate areas the size of the various sectors of Ottawa's Greenbelt." The difference between the R Urban project and Ottawa's Greenbelt is that in Paris, the closed loop system is necessary to combat pressure from the surrounding urban landscape.

figure 3-11 Attempt at applying a circular programmatic scheme to the Southern Farm District. This schematic was abandoned as a closed-loop system seemed counter-intuitive to a land mass that was already dealing with underuse

3.4 Four Fields

Four Fields is an architectural project completed by L'ouef architects in Montreal. The site is in Mont Tremblant, Quebec, with a very similar climate to Ottawa. The program is intended to be for a family, with a wide range of different interests that needed to be supported by the architectural program. Figure 3.12 illustrates the various programmatic ideas. The main design feature of this project is a dividing wall that supports a variety of different functions. “The wall is the armature for the program, hosting a series of functions including a greenhouse, outdoor kitchen, covered living spaces, and the residence itself.” (from L'Oeuf website).

This project acts as a relevant contemporary case study for agricultural buildings in northern climates. The simple gesture of the wall also provides an exceptionally good way of organizing the farmland.

figure 3-12. Program Schematic of “Four Fields” taken from website www.loeuf.com

figure 3-13. Four Fields, Sense of Materiality taken from website www.loeuf.com

3.5 Conclusion

All four of these projects provide interesting insights into 1) Ottawa's Greenbelt site, 2) potential agricultural programs which are relevant to Ottawa, 3) integrated architectural systems and 4) specific building designs. All of these will be considered in the proposed design for Ottawa's greenbelt.

Chapter 3 References:

Farming Incubator's Offer Way In: there's a new program for people wanting to try farming without a big money investment, CBC, 23rd June 2012, Web. Nov.1st 2013

"Four Fields" L'Oeuf Architects <http://www.loeuf.com/projects/four-fields/> Feb.14th 2014

"Just Food- Start-up Farm Program" retrieved Oct.20th 2013 from www.justfood.ca/startupfarmprogram

Personal Interview with Laura Benes, Sept. 20th 2013

R-Urban. Web. R-urban.net Oct.15th 2013

CHAPTER FOUR - DESIGN

Establishing an appropriate program and architectural design to Reactivate Ottawa's Greenbelt

figure 4-1. Concept of Site Location within the concept of Ottawa's Greenbelt

4.0 - Introduction

It is clear that Ottawa's greenbelt is located in a particularly unique political and geographic situation. There is great potential for an innovative and grounded design project that could effectively help to reactivate the land into a productive agricultural landscape while providing an educational experience for the people of Ottawa.

4.1- Defining design criteria

The first step in designing, was to 1) See the Greenbelt as one land mass. Identify transit zones, agricultural land, and to re-frame the land mass as “non-urban” and “non-suburban”- but rather, an in between transit zone surrounded by agricultural fields.

2) Identify an optimal area for study, which accepts and acknowledges the condition of the high rate of demolished farms, but also celebrates the continued success of farms that continue to be productive since expropriation.

Figure 4.2 The greenbelt within the context of Ottawa. The downtown area contained by the interior boundary of the greenbelt, and the outside communities- Orleans, Barrhaven and Kanata meeting up to the exterior boundary of the greenbelt.

Figure 4.3 The greenbelt within its current programmatic functions. Identifying key transit zones, farmland, walking paths and biking trails.

4.2 Site Selection

Figure 4.3 Major transit zones of the greenbelt, connecting the urban and suburban areas

Figure 4.4 Selected area of study

4.3 Determining Architectural program

The ultimate intention of the intervention in the Greenbelt was to establish an infrastructure that highlighted and maintained existing healthy fabric (barns, farmhouses), made connections and/or completed existing recreational paths, optimized existing municipal infrastructure, celebrated the landscape and offered opportunities for agricultural education.

Figure 4.5 Existing condition of site

A farmers' market is an obvious draw that prospers from proximity to both urban and suburban markets while featuring the agricultural production of the area. The chosen site for the farmers' market adaptively reuses the barns and farmhouse of an abandoned farm that lies directly at the end of a trail head bike path and it is easily accessed from a busy road, adjacent suburban development and across from an existing and successful strawberry U-Pick farm.

At the opposite end of the site, a living machine also provides an interesting and relevant program which could benefit the surrounding suburban population by redirecting some of their sewage treatment away from conventional chemically-based systems and providing clean water for irrigation to the rest of the site. The chosen site for this program was selected with four key factors in mind 1) it is directly off Fallowfield road, providing high visibility from the road 2) it is at the intersection of two trunk sewers, making it the optimal location for absorbing sewage inflow. 3) the land just south of the abandoned farm site is zoned as development research 4) It currently is yet another dead end in the existing bike trail.

figure 4.6 Keyplan of site

Figure 4.7 Existing Barn on Merivale Road, proposal to be converted to Farmer's Market

Figure 4.8 GeoOttawa's mapping of Trunk Sewers in Ottawa, showing a connection point at selected location

By selecting these two sites, a 1.9km gap was identified between the farmer's market and the living machine. Between the two lie two successful farms, and in the centre, a large agricultural lot that has been abandoned.

4.4 Connecting the Farmer's Market and Living Machine- Establishing a path

The proposal connects the two trail heads (at both the living machine and the farmer's market) to one another via a transit path that runs through the abandoned farm land, and then alongside the more successful existing farm land of Fallowfield road. This circulation path is for bikers during the summer and cross country skiers in the winter, while also acting as a distribution line for the clean water produced at the living machine and the electricity produced by the solar panels at the farmer's market.

The proposed path is defined by a rammed earth wall of varying heights and responds to specific site conditions. The following pages reflect the varying forms of the rammed earth wall weaving through the site, at one point arriving at the major design component of this thesis, and then eventually ending at the living machine.

Figure 4-9 Keyplan of connecting pathway

Index of Sections through the Site

Figure 4-10 Keyplan of SECTIONS through the site

Figure 4.12 Keyplan locating Farmer's Market on the Site

Site Plan of Farmer's Market

- A. Parking (with solar panel shading)
- B. Existing Barn to be converted to Farmer's Market
- C. Additional market stalls to be implemented in the wall
- D. Rammed earth wall

Sections (1-5)

Sections (6-10)

6. Wall begins to narrow, offering a stair down

7. Wall running alongside Merivale road offers UA planter boxes for individuals looking for a small plot of land

8. Wall sinks back down into earth (allowing to cross farm road)

9. Wall begins to climb, once again

10. Wall continues to rise as it approaches the bridge

Sections (11-13)

11. Bridge over Fallowfield Road

12. Wall expands into kitchen space

13. Wall expands into restaurant space

4.5 Defining a Major Design Component

In order to address the main agricultural component of the program, the proposal introduces significant farming infrastructure that focuses on 1) food production (including the extension of the growing season) to address the needs and trends of future farming (growing locally) and 2) providing education and community engagement via a visitor focused/attraction based program. The site for this infrastructure is just south of the intersection of the proposed path and Fallowfield Road with easy access and visibility from this main artery. This is prime agricultural land that lies halfway between the proposed farmers' market and the proposed living machine is currently abandoned.

figure 4-12 Keyplan of Major Design component in overall scheme

figure 4-13 Program Schematic for Food Hub

The agricultural program components are organized around and/or attached to the rammed earth wall that defines the circulation path through the site. There are five major programmatic functions. 1) an apple orchard that is visible from the road and accessed via the rammed earth wall, 2) a restaurant serving locally grown food with a look out tower overlooking the site, 3) a shop, allowing for the sale of apples, as well as bulk food distribution to individuals not able to go to the weekly Farmer's market up the road 4) greenhouses that extend the growing season and $\frac{1}{4}$ or $\frac{1}{2}$ acre plots for cultivation of fruits and vegetables by community members interested in farming a parcel of land, 5) a food processing facility that would support and maintain farming operation, such as cleaning, sorting and packaging the food produced on site.

The buildings are designed to be functional and address environmental issues. All but the restaurant service the land and the food produced on the land. Therefore they take the following massing form. The restaurant however, is a different architectural form as its programmatic function depends more heavily on the interior experience of the user.

figure 4-14 Keyplan of Food Hub in relation to the site

figure 4-15 Photograph of 1:1250 model

figure 4-15 Photograph of 1:150 model demonstrating the wall in relation to the buildings

Each architectural component of the design has been developed as follows:

1) Apple Orchard

The apple orchard provides both an interesting activity for visiting tourists as well as a visual indicator from the road of the agricultural development on the site. The rammed earth wall to the south provides storage for apple-picking baskets, and tools.

2) Restaurant

The restaurant, emphasizes the enjoyment of and the view of the land. Its exterior will take advantage of salvaged barn board which is readily available in the greenbelt from the demolished farm sites in the area. Its interior will take full advantage of daylighting and views of the farming operation.. The food, produced on site, will be carried through the rammed earth wall into its kitchen.

3) Shop

The shop on the north side of the rammed earth wall will act as a store-front for the entire operation, selling apples from the orchard, bulk produce from the greenhouse operations, meals made in the local kitchen, and honey produced further along the wall in the beeboles.

4) Greenhouses

The greenhouses on the site are intended for use by community members to produce food for either the production of Community Support Agriculture shares (ie. “food baskets”) or for sale at the Farmer’s Market. These greenhouses are angled towards the rammed earth wall to optimize the light coming from the south and collect rainwater that is stored in cisterns in the rammed earth wall for use within the greenhouse.

5) Food Processing

The food processing building is intended as a warehouse space for cleaning, sorting and storing the produce before being sent out for distribution. Workers in the greenhouses can easily access this space through the wall.

Food Hub Floorplan

- 1.Storage space
- 2.Kitchen
- 3.Restaurant
4. Pathway through kitchen
5. MAIN ENTRANCE
6. Pathway for greenhouses/food processing
7. Store
8. Office
9. Cleaning/Sorting and Packaging area
10. Shipping/Receiving
11. Greenhouses

figure 4-16 Photograph of 1:150 model

4-17. Rendering of Food Hub Entry

4-18. Rendering of Food Hub Entry with shop

Sections (14-16)

14

15

14. Wall expands into restaurant and look-out

15. Shop is constructed on north side of wall

16. Shop feeds into food processing building on the north side and greenhouses on the south

figure 4-19 Photograph of 1:150 model, South Elevation

figure 4-20 Render of interior restaurant space

Sections (17-18)

17. Space between Greenhouse and Wall

18. Space between Greenhouse and Wall

figure 4-21 Render of Interior Greenhouse

figure 4-24 Rainwater Collection feeding off the roof structure

figure 4-25 Re-orienting the traditional farmhouse structure for rainwater collection

figure 4-26 Roof Structure

4.6 Continuing the Path

Moving further down the site, the wall, once again, diminishes into the landscape, emerging once again in an existing area of foliage. Here the wall will continue to act as a recreational path on it's west side, while also acting as a covered space for bees on the other side.

Finally, continuing down the path to the most southern area of the site, the wall becomes the support system for the living machine, previously described above, acting as a book-end to the project and connecting with the existing bike trail.

Sections (19-20)

4-27 keyplan of living machine
in relation to the site

Living Machine

1. holding tanks
- 2-4. biodigestive processes
5. clarifying filter
6. reed beds
7. water tower

Sections (21-24)

21. Wall climbs for Living Machine

22. Living Machine

23. Wall descends

24. Wall goes back down into earth

4.7 A note on materiality:

The greenbelt offers many things in great abundance; open space and land being its greatest asset. Celebrating this land is fundamentally the purpose of this project, therefore it is crucial to use appropriate materiality to ground the architecture in the local agricultural context. The following three materials have been selected as the main building components:

1) Rammed Earth: Earth is the most accessible and available resource available in the Greenbelt, therefore it has been selected as the key material in building the circulation path throughout the site. In using rammed earth, the construction process can happen gradually and with little machinery, promoting a sense of community involvement in the construction process. Also, given the flexibility of the material, it can respond with sensitivity to the landscape, changing its height, width and program as it weaves its way through the Greenbelt.

figure 4-28 image taken from rammedearth.blogspot.ca

figure 4-29 Strawbale harvesting Minke "Building with Straw"(p.20)

2) Strawbale: Strawbale offers an accessible and effective way to thicken the rammed earth walls as necessary throughout the site. Additionally, using a common material that is produced on site, adds meaning to the intention to take action and support local agriculture in the Greenbelt.

3) Salvaged Barn Wood: Since a large number of agricultural properties, built in the early 1900's, have been demolished in past years within Ottawa's Greenbelt, the potential to salvage building materials from these properties is very real. Using barn wood from abandoned barns and farmhouses within the greenbelt adds cultural richness to the new construction.

4.5 Conclusion

In order for this design to be successful, it must first be rooted in the reality of the land condition and secondly it must address the agricultural needs of Canadian farming infrastructure. Given the sizeable land mass of this sector of the greenbelt, this design will not be one single building but rather a series of buildings that communicate a similar and iconic design language. As with any continuously productive urban landscape, these buildings will be designed based on principles of sustainability.

CHAPTER FIVE- CONCLUSION

Ottawa's Greenbelt has shown very little infrastructure development since the mass expropriation of land that created it in 1965. Every year, more and more buildings have reached the end of their life cycle and are being demolished. Rarely is something built in their places, and if they are, it is solely to replace an existing building function. Tenants are dissuaded from using the land because of the highly bureaucratic leasing policies of the National Capital Commission.

Additionally, agriculture in Canada is changing in a variety of different ways. At the large scale, monocrop farming continues to be the trend among commercial farmers, who typically operate farms exponentially bigger than the ones offered in the Greenbelt. However there is also considerable interest within the Ottawa's community in a more intimate relationship with smaller scale farming. Many families wish to engage more directly with the processes of food production, and in some cases, wish to be able to grow their own produce themselves.

Repeatedly, the National Capital Commission acknowledges that the greenbelt is intended for use as public farmland, however very little is being done to move forward. Now that the city is growing around the greenbelt, it is uniquely poised for development as a public agricultural amenity and this presents an opportunity for the NCC to show leadership and innovation regarding the development of a sustainable agricultural system. New infrastructure with an agricultural program that benefits and serves the population of Ottawa needs to be implemented in order for people to recognize the significance of this land. Degradation of the land has reached a point where immediate action has to be taken. Otherwise, public opinion and mis-education will continue to dominate public discourse and portions of the greenbelt will be sold for unknown forms of development.

The development of a design for a particular sector of Ottawa's Greenbelt is a way of testing the thesis question: namely what kind of infrastructure can be developed in Ottawa's Greenbelt that will help to reactivate the land into a productive agricultural landscape? The design went through many iterations before settling on the proposed project described in this thesis. Taking a step back and analyzing the design process is one way to identify the key issues that become apparent when addressing this complex issue. Should the process work, it should then be possible to apply a similar process to a different sector of the Greenbelt and come to a different but equally compelling infrastructure that would reactivate that area into a productive agricultural landscape.

The design criteria uncovered through the design process are as follows:

1. The Greenbelt sector needs to be considered in terms of its existing building stock, quality of farmland and physical and visual accessibility via the network of roads and arteries.
2. The surrounding neighbourhoods need to be studied with emphasis placed on potential connections between those neighbourhoods and possible agricultural programs with the Greenbelt.
3. The selected area needs to be situated within the regional network of recreational pathways.
4. A multifaceted program needs to be developed whose components are somehow connected to the strengthening of community centred agriculture and with the intention to educate the public regarding the importance of local, environmentally sound food production.
5. The infrastructure developed to enhance or enable the above program needs to be constructed using sustainable design principles such as reusing or recycling existing building stock, using locally available materials where possible, using renewable or recycled materials where possible, maximizing daylighting systems in interior spaces, collecting rainwater to store for irrigation, reusing grey water where possible, treating black water where possible, focusing on native plants species for landscaping, etc.
6. The whole project needs to show respect for the land and celebrate it as a valuable resource that is not to be squandered. Instead, the project needs to invite people and facilitate their experience of this public landscape.

The specific design strategy of structuring development around rammed earth walls that define pathways was the strategy taken in this thesis for the Southern Farm Sector, but I believe that it could be an element that could ultimately reactivate and unify the entire Greenbelt. Using the existing transit routes as the starting points to anchor agricultural events, these walls could ‘grow’ together into a web of agricultural roads, re-activating the land along their way. Of course, there are an infinite number of ways this could happen, and being that the greenbelt is such an enormous land-mass within the city, such a network would take many years to develop. Below is an image of such an imagined future, bringing to life the potential and original intention of this space as ‘public farmland’ and capitalizing on the new form it creates within the city. Ultimately the greenbelt should no longer be a place of uncertainty. It should be a place that people are proud of, allowing Ottawans and visitors to use the land as it was intended to be used and to be a model of community based agricultural infrastructure for the rest of the country.

Figure 5-1 Overall concept of Re-activating Ottawa's Greenbelt

Figure 5-2 Additional sites have been also identified as key zones which would support additional agricultural infrastructure development

Figure 5-3 Possible future takeover of the greenbelt as a productive agricultural area of the City of Ottawa