Brown to Green, Let's Get Clean!

Reactivating Cornwall:
A Closer Look at Gas Station Brownfields

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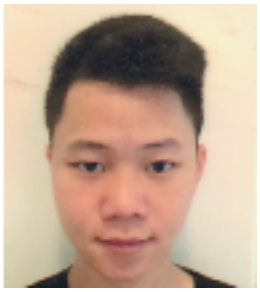
Staff Team

There are twelve Urban and Regional Planning team members involved in the Cornwall Brownfield Remediation Proposal. The team is composed of a diverse and unique group of individuals, with experiences and knowledge in various fields of study.

	**Calvin Bi (Wen)** is a third year undergraduate student at Ryerson University, currently finishing his Bachelor's degree in Urban and Regional Planning. He is interested in geography, the landscapes of urban locations, geographical locations of cities, and how cities function with different aspects that surround them. He also strives to plan for the natural environment, with a focus in minimizing pollution.
	**Zosia Bochinska** is a second year undergraduate student studying towards a Bachelor Degree in Urban Planning and Development at Cardiff University in Wales, UK. She is currently at Ryerson University in Toronto as part of an international exchange. Her educational background includes urban geography, sustainable development, economics and urban design.
	**Rachel Bregman** completed her Undergraduate Degree from the University of Toronto. She majored in Latin American Studies and double minor in History and Geography. She is now a first year PLAB student joining the third year Urban and Regional Planning program at Ryerson University. Rachel worked at Brook Restoration Ltd. as a Planning Project Manager Assistant, and most recently, worked as a Research Assistant at Ryerson University. She has travelled extensively throughout Europe, gaining a rich and deep understanding of European architecture and urban design
	**Dale Egan** holds a Honours Bachelor of Arts in Geography with a Geomatics Option from Wilfrid Laurier University. After finishing his degree, Dale worked within the construction industry for two years before deciding to enter the PLAB program in Ryerson's School of Urban and Regional Planning. Dale has some interest in brownfields and remediation of former industrial sites but is still trying to determine where his interests lie.

	**Eric Gao** is a third year undergraduate student in the Ryerson Urban and Regional Planning Program. His studies have been focused on how the development of cities can be integrated in a manner that is both environmentally and socially sustainable. Eric recently completed a placement at the STEPS Initiative, a public arts organization, and hopes to bring those experiences into exploring how public art can be a vital part of reactivating brownfield sites.
	**Ethan Laman** holds an Honours Bachelor of Arts in Political Science (concentrating in Public Law) from Brock University. Ethan is currently a PLAB student in the Urban and Regional Planning program at Ryerson University. His educational background includes law, municipal politics and policy. Ethan has interest in brownfields remediation, with experience studying brownfields in the city of Pittsburgh.
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	**Lucy Wakelin** is a Human Geography and Urban Planning undergraduate at Cardiff University, currently undertaking an exchange semester at Ryerson University, Toronto. Primarily interested in environmental planning with a view to pursuing a career in sustainable urban development. She is hoping to secure a placement as part of her degree programme and very much looks forward to applying her skills and developing her interests within a professional planning environment. She is also an avid dancer and traveller, with a love for the countryside.

	**Alan Ważny** is a graduate of Mohawk College, having completed the Urban and Regional Planning Technician - GIS program of study in 2015. For 2 years he worked as a Draftsman at A.T. McLaren Ltd. Legal and Engineering Surveys, specializing in Land Titles Reference Plans and Legal Plans of Condominium. Alan is currently in his first of two years at Ryerson, as part of the PLAD two year degree completion agreement with Mohawk College.
	**Nick Whittington** is a second year undergraduate studying a semester at Ryerson University on international exchange from Cardiff University in Wales, UK. He has a Bachelor of Technology in Town Planning and is currently employed on a freelance basis by New Forest District Council in the South of England as a Technical Planning Officer. His background is primarily in small-scale housing developments and rural planning. In 2017 he delivered a presentation about the impact of driverless technology on urban design at the RTPI National Planning Convention in London.
	**Brittany Wong** completed her Honours Bachelor of Science at the University of Toronto. Majoring in Environmental Studies, she is highly interested in learning about the best urban planning practices situated around bettering the future. She is currently a third year PLAB at Ryerson University's School of Urban and Regional Planning. She knits odd shaped knitted pillows for her etsy store, and is very involved in the school community. She is an active member of Ryerson Association of Planning Students and Sustainable School of Urban and Regional Planning, and is the VP of Creative Media for the Canadian Planning Students Conference (PLACE) 2019.

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1.0 Introduction

Founded in 1784, the City of Cornwall is one of Ontario's first and oldest established communities. The City is conveniently and advantageously located just an hour from Montreal and Ottawa, and is just a short bridge ride from New York State (City of Cornwall Official Visit Guide, 2018). Cornwall has a stable population of 46,400 people (City of Cornwall Official Plan, 2018); the community has an array of services and amenities which provide an excellent quality of life. The City has gone out of its way to provide world-class amenities that would be expected from a big city, such as Toronto, yet maintain a small-town charm and hospitality feel. With a beautiful landscape, numerous parks to enjoy, beaches, campsites and conservation areas, Cornwall has lots to offer to its community. Cornwall is a great example of a community planned around work, live and play. Despite all the wonderful attributes that Cornwall has to offer, the City is facing difficulties in attracting and acquiring brownfield investments - similarly to other towns across North America. With guidance from the City of Cornwall objectives, Catalyst Consultants helps provide a fresh and unique perspective to tackling brownfield development.

1.1 Purpose

A brownfield site is defined as "an abandoned, vacant, derelict or underutilize commercial and industrial properties, usually provided with urban services, where past actions have resulted in actual or perceived contamination" (Cornwall Brownfield's Programs Application Package, 2011). There are approximately 30,000 brownfields in Canada (Ministry of Municipal Affairs and Housing, 2007), with many being located on prime real estate. Each site provides an availability for future opportunities of redevelopment, which in turn, helps to boost and nurture the surrounding neighbourhoods and communities.

The purpose of this report is to develop an approach for the Planning, Development, and Recreation Division of the City of Cornwall to prioritize former gas station sites within their brownfield inventory. By applying a context-based selection criterion, and proposing potential concepts for a leave-as is use, beautification use, interim use, and redevelopment, the brownfields with the greatest development potential can be targeted. Communities across the province have been left with the responsibility of discovering innovative ways to manage their abundance of abandoned developments, as the anticipated time and resources required for remediation are not always reliable due to unforeseen contamination.

Cornwall has approximately a combination of 561, current and former, brownfield sites; 145 of the total are gas stations and 119 are decommissioned (Cornwall GIS Material, 2019). Gas station brownfields provide a unique opportunity for redevelopment, as they are often situated on highly visible and accessible major intersections, such as downtown cores and street corners. With the City's intent to promote a vibrant public realm that can attract youth and

foster the development of a growing tourism sector (City of Cornwall, 2018), vacant gas station sites stand as an obstacle, but also an opportunity to revitalise many of these sites as anchors in the community.

This proposal applies literature review, community plans and feasibility approaches to revitalize former service stations. It will also highlight remediation best practices, policies and frameworks, and redevelopment projects in North America and across the globe. These, combined with tax and funding incentives, and environmentally sustainable practices, will provide any municipality with the tools necessary to undergo a brownfield redevelopment project. Specifically, the City of Cornwall has increased their brownfield cleanup activity to include nine government programs with financial incentives as a tool for executing their visions (Cornwall Brownfield's Programs Application Package, 2011).

Cornwall has had success in multiple brownfield revitalization projects. One of the more well known developments is the Cotton Mill Lofts, which were originally used for industrial and factory purposes (Cotton Mill Cornwall, 2012). The successful conversion of the factory into residential condominiums demonstrated a positive example of a pragmatic outcome that arises from pressure, creativity and community engagement by the municipality.

1.2 Objectives & Opportunities

The objective is to create a proposal, providing planning and policy guidance, to ignite the reuse, revitalization, and redevelopment of abandoned service stations in Cornwall, ON. Catalyst Consultants sees this partnership with Cornwall as an opportunity to raise awareness, increase public education, and initiate discussion and interest of future stakeholders, developers and municipalities about brownfield redevelopment. The team will highlight ways to take advantage of underutilized, vacant, and contaminated sites. In turn, changing perspectives of brownfields as a burden to an opportunity.

The proposal outlines four possible development plans for previous service station brownfield sites in the City of Cornwall: leave-as-is, beautification, interim use and redevelopment. Depending on the contamination levels and environmental assessment, different fates may be prioritized. Leave-as-is options tend to be relevant for situations which require further investigation, where as beautification offers low-cost approaches to improving the aesthetic appeal of a blight, unwelcoming site. An interim use is a temporary option that allows for creative flexibility to increase community and stakeholder interest until redevelopment becomes feasible. Lastly, a permanent redevelopment is an investment meant for innovation, and economic and social growth.

The overarching intention for brownfield remediation is to attract developers and provide more opportunities for a work, live and play environment.

"Cornwall's brownfield initiative supports remediation to help developers revitalize brownfield sites in the city each program is designed to further the specific goal of redeveloping and re-using brownfield sites which are blighted by the effects of environmental contamination. Brownfield are abandoned, vacant, derelict or underutilize commercial and industrial properties, where past actions have resulted in actual or perceived contamination"

(City of Cornwall Community Improvement Programs: Recover Potential, 2018)

In pursuance of devising a strategy and identifying key components of a planning and development approach for the City of Cornwall, Catalyst Consulting proposes to take the following actions:

- Review current municipal, provincial and federal policies and planning frameworks which oversee the management and redevelopment of brownfield sites;
- Utilize scholarly and professional literature associated with policy, planning, funding, land reuse, national and international case studies, and other relevant issues to provide a foundation for best practices;
- Manage inventory of former service station brownfields in Cornwall to document community and development characteristics and guide the City's planning and redevelopment efforts;
- Propose four different forms of brownfield reactivation: leave-as-is, beautification, interim use and redevelopment project, for opportunistic sites that will contribute to the community from a social, economic and environmental aspect.

2.0 Understanding Cornwall

2.1 Cornwall Context

Understanding the context of the City of Cornwall is integral for the team to compile and deliver the most well-informed proposal. Reviewing the history of Cornwall, as well as analyzing their current social shifts, has facilitated a deeper understanding of the wider contextual landscape. This has informed our redevelopment decisions at every stage.

2.1.1 Cornwall History

The City of Cornwall has a long and diverse history. Established by the United Empire Loyalists in 1784, it is one of Ontario's oldest permanent settlements. Cornwall was a gift from the Crown in reward for the Loyalists service during the war. The Loyalists, fighting on behalf of Britain, helped to defeat the American Troops at the Battle of Crysler's Farm which helped keep Upper Canada intact and connected to Montreal (Choose Cornwall, n.d.). The City is conveniently and advantageously located just an hour from Montreal and Ottawa, and is just a short bridge ride from New York State (City of Cornwall Official Visit Guide, 2018). Cornwall is situated on the shores of the St. Lawrence River, close to the United States border. The City comprises an 80 km^2 land area, approximately 110 km south-west of Montreal and 100 km southeast of Ottawa (City of Cornwall Official Plan, 2018). As part of the Windsor-Quebec City corridor, the City is a stop-off on a number of important transport networks; namely Highway 401 and the CN mainline. Access to the New York State is provided by the Akwesasne Bridge via Cornwall Island. This, combined with the lower hydro rates and affordable housing market, makes Cornwall an attractive place for development.

2.1.2 Cornwall Demographics

According to the Cornwall Official Plan, the City has a total population of 46,400 (City of Cornwall Official Plan, 2018), with a growth rate of 0.5% from 2011 to 2016 (Statistics Canada Census, 2016). This is relatively low compared to a national growth rate of 4.6% or a 4.5% in Toronto (StatsCan, 2016). The population growth rate has been stable since the 1950s, other than the dramatic increase during the baby boom period and a period of slight increase between 1996 and 2001. A Municipal Comprehensive Review was conducted to determine the population projections of the city, showing a 7.3% increase of 49,700 by 2026. Although population growth has remained stable, economic activity has been grown over the past few years, shown by various reports done by Cornwall Economic Development, with an increasing number of developers and investors (Choose Cornwall, 2018).

The Cornwall Economic Development report shows multiple characteristics of the Cornwall population. Approximately half of the population speaks both English and French, only about 20% of which are French mother tongue, suggesting that some residents travel into Quebec for purposes other than work and leisure. The average annual income in Cornwall is relatively low compared to National and Ontario averages and this has been the case throughout history. The median total income of households in Cornwall is $46,564 (Statistics Canada, 2015)**.** The lowered overall cost of living in Cornwall helps reduce the effects of low-income rates as about 70% of residents spend less than 30% of their income on housing. Statistics has also shown that the majority of the workforce is inbound, about 55,470 Cornwall employees are Stormont, Dundas and Glengarry (SDG) residents and about 20,850 employees are Cornwall residents. Finally, in terms of educational statistical data, 20% of residents have a college degree and 8% with a university degree.

Cornwall has a growing retirement population. The average age in Cornwall was 44.3 years, higher than the general Ontario average of 41 years. With a median age of 46.6 years (Statistics Canada, 2015)**,** Cornwall has also surpassed the 2030 projection of 42.2 years for Ontario, making it home to one of the largest senior groups. By 2025, Cornwall expects that 30% of its population will be over the age of 65 and in preparation for this demographic shift, the City of Cornwall has been proactive in making its community more senior friendly. For example, the Senior Friendly Community Implementation Plan, adopted by Cornwall Council in 2017, details some practical recommendations to ensure Cornwall continues to address both the current and future needs of older residents in Cornwall.

Additionally, there is a challenge to attract youth, families and employment opportunities. Cornwall's increasing struggles with youth retention and attraction are reflected in the Data Book 2018. It states how a decline in the population of youths (aged 0-19) from 21% to 19% is expected by 2036, as well as young and mid-life adults (aged 20-54) reducing from 45% to 39% in the same time period. The presence of young citizens is important for community vitality and sustainability, and therefore intentional efforts should be made through our redevelopment options to attract and nurture this demographic group.

The projected population shifts for the City of Cornwall offers a prime opportunity for social intervention through our brownfield site remediation, to meet changing needs and successfully engage citizens of all ages.

2.2 Provincial Policy Statement

2.2.1 Brownfields

While Ontario's Provincial Policy Statement remains general and broad, it does address brownfields and what should be done with them. In the policies section of the PPS, section 1 discusses building strong and healthy communities. Under this, settlements and rural areas are

a subsection which mention brownfields. In section 1.1.4.1, one of the suggested ways of creating healthy rural areas is by promoting redevelopment and regeneration of brownfield sites. Further along, in the long-term economic prosperity subsection (1.7), it is mentioned that one of the supports of long-term economic prosperity should be redevelopment of brownfield sites.

While these two mentions of brownfields are in different sections, they mostly highlight the basic assumption of our project: redevelopment of brownfields can be a great investment for revitalization of communities. Beyond this, however, very little is offered in terms of specifics for how this should be done. Logically, these specifics would be part of other more targeted plans, notably in Cornwall's Official Plan. The use of mentioning brownfield sites in the PPS is just to let planners know that their redevelopment can be a focus, or that brownfield projects can be justified as being consistent with the PPS.

2.2.2 Rural Development

Another large aspect of Cornwall which the Provincial Policy Statement hits on is its rurality and rural development, which is the focus of section 1.1.4. In addition to mentioning the redevelopment of brownfield sites, this section mentions ways of promoting rural character and methods of development.

Most of the methods focus on sustainable growth and redevelopment instead of outright expansion. Subsection 1.1.4.1., which also outlined the importance of revitalizing brownfield sites, points out that housing stock should be conserved and revitalized when needed, which could inform our redevelopment housing option. Significantly, the subsection promotes mixed use in development, informing all possible uses. Another focus of the subsection is tourism, which could be a focus of the interim and beautification uses.

2.3. Cornwall Official Plan

The current Official Plan for Cornwall was approved on April 11th, 2018 by the Assistant Deputy Minister Affairs/Housing and is in force for the next 20 years. The policies that relate to the brownfields in Cornwall are in a table in Appendix-A.

2.3.1 Growth Concepts & Policies (OP 3.0)

2.3.1.1 Goals & Principles

The first section of the Official Plan policies focuses on how to manage and implement growth. The section starts with the goals and principles (Section 3.2 of the Official Plan), which outline that a minimum of 20% of new residential development must be done through intensification and redevelopment, which we could consider our brownfield redevelopment projects to be.

The goals also explain that new developments must still fit with the older landscapes, as well as be within suitable areas. Thus, we should aim to implement development among already known cores and areas, instead of branching out beyond existing neighborhood and communities.

2.3.1.2 General Development & Growth Concepts

The next section, 3.3, applies the goals and principles laid out before and puts them into tangible policy. For example, new developments are distributed depending on both social services, as well as infrastructural services like sewers.

It further points the growth to avoid spreading out by adding residential to existing subdivisions, infill sites and vacant lands among developed areas. The section also details urban boundary expansion, which would only happen in the case of growth not being sufficient among current boundaries, and with available infrastructure. Overall, however, it seems that this would be mostly avoided.

Later in the section, the Official Plan refers all rural growth policies to its own section, Rural Area Land Use Designation. The section ends by encouraging the start of higher density and more compact development, in spite of the existing trend in Cornwall being low density.

2.3.2 Land Use Designations & Policies (OP 4.0)

2.3.2.1 Interpretation & Scope (OP 4.2)

Cornwall manages land use through the major land uses which follow the interpretation section, but land use can also be managed through secondary plans and plans of subdivision. The policies and uses laid out in the Official Plan are not meant to be exhaustive or prescriptive like zoning bylaws, but are guidelines for good planning.

The Official Plan identifies a “Special Consideration Area” under 4.2.12 of 12 properties which were previously zoned as Commercial Zone 41. This Special Consideration area is under study to determine if a zoning designation not specifically found in the OP such as a Highway Commercial Zone is appropriate for these lands.

2.3.2.2 Urban Residential (OP 4.3)

Urban residential refers to all buildings used as dwellings including detached and semi-detached homes, duplexes and all other types of row houses, as well as high-rises and condominiums. Uses that are complementary to residential uses such as institutional or small commercial uses are permitted in Urban Residential areas granted that they are compatible with the primary residential use.

The OP lays out 10 goals and 25 policies relating to development of Urban Residential lands. The goals are focused on providing sufficient and high quality housing through a variety of housing forms to create and promote healthy communities. Promoting a healthy community includes planning around maximizing existing transportation and institutional uses, and providing new services for residents where necessary, including group homes.

The policies in the Official Plan seek to guide the development of Urban Residential Areas in Cornwall. While there are 25 policies under the OP, 10 of these policies are specific property exemptions from the policies. None of the selected brownfield sites are subject to exemptions under the Urban Residential section of the OP. These policies do not give specific height or density requirements, but promote mixing of heights and densities through a gradient. Furthermore, mixed use is permitted in Urban Residential Areas granted that it is built to service the needs of the immediate neighbourhood or the residents of the building.

2.3.2.3 Commercial Designations (OP 4.4)

Commercial Designation policies under the OP apply to both the Business District and General Commercial land use areas. The goal of Commercial development is to promote the strategic placement of commercial properties by locating them along major transportation nodes and within areas which are able to maximize their use. The proper placement of these districts is deemed important, and the plan has guiding principles such as promoting a balance of commercial areas throughout the city and providing sub-categories of commercial areas to better manage where different types of commercial properties should be located.

Policy 7 under 4.4.3 of the Official Plan states that reusing abandoned service station sites such as gas station brownfields is encouraged within Commercial areas.

2.3.2.4 Business District (OP 4.5)

The Business District refers to areas with a high concentration of commercial activity including The Downtown and Le Village, known as Business Improvement Areas (BIAs). These areas have BIA policy documents that guide their development and management, which are discussed in section 2.4 of this report. All goals and policies relating to the Business District are designed to promote local businesses by improving sidewalks and other linkages between commercial areas to facilitate pedestrian traffic in these areas and by providing parking for vehicles as well as bicycles. The Official Plan also focuses on helping business owners by providing grants to help local business, and by promoting redevelopment in commercial areas. The City proposes that Business Districts are suitable for mixed commercial/residential developments.

2.3.2.5 General Commercial (OP 4.6)

General Commercial areas can be divided further into two more-specific areas; namely Highway Commercial and Community Commercial. The difference between these areas is their

area, and the differences in specific land uses between these sub zones is laid out in the zoning bylaw. Generally, the Highway Commercial category seeks to meet the needs of the travelling public and consists of uses such as motels, eating facilities, automotive centers and tourist facilities. Community Commercial entails most other commercial uses in the City. Some uses are too specific to fall under either of these categories but still fall under the OPs General Commercial Policies.

Mixed Commercial guidelines are focused on creating high-quality commercial developments that fit within the fabric of the city. Cornwall employs a method of tight control over large commercial developments, and requires site plan approvals including control over signage, lighting, landscaping and other elements of a major commercial project. This also includes limiting the number of freestanding structures in a development, and by expanding existing commercial areas when feasible.

2.3.2.6 Major Institutional (OP 4.7)

Major institutional uses are those uses which are for public services, but do not fit into residential areas. These can include post-secondary schools, government offices, large recreational facilities and religious institutions, among others.

While Major Institutional uses are not compatible with residential uses, they must still be located in such a way that they are accessible by residents. In order to promote efficiency of access, Major Institutional uses should be grouped together. In order to achieve this, the City advises that long term plans for future institutional developments be drawn up, through cooperation of different agencies. Such plans should consider constraints and opportunities of perspective sites for future development before any plans are finalized. Furthermore, the City recommends grouping together institutional, recreational and educational uses where available to create centers.

2.3.2.7 Employment Area (OP 4.8)

Employment Areas can also be referred to as industrial areas. These include manufacturing, storage yards, transportation yards, warehousing, as well as automotive servicing and repair centers, office parks and industrial-commercial malls. The main goals of the Employment area policies is to minimize conflict between industrial uses and other uses, as well as to promote suitable Employment development and redevelopment. As part of the Employment Area policies, Cornwall is seeking to establish service, general and heavy industrial employment areas to classify conformity between other uses; where Service Employment would be the most compatible with other uses and Heavy Industrial would be the least compatible with other uses. New employment developments are favoured in existing employment areas where intensification is the prefered tool. Furthermore, industrial uses near Highway 401, should be protected.

2.3.2.8 Rural Area (OP 4.9)

The five goals of Cornwall's Rural Area policies are: preserving quality agricultural lands, promoting efficient agriculture operations, maintaining a rural character, preventing urbanization and considering the Provincial Policy Statements policies on areas outside of the Urban Area. The related policies seek to protect agricultural lands by making severences of agricultural lands difficult, and reducing the number of plans of subdivisions allowed within agricultural areas. An annual monitoring of new developments within agricultural areas is conducted by city staff to mitigate negative impacts on agricultural land.

2.3.2.9 Open Space (OP 4.10)

Open Space refers to large parks and recreational areas whereas small parks and intensive recreational facilities such as arenas do not fall under this distinction. The City's goals in this area revolve around providing and maintaining open spaces in accordance with city policies that contribute to a healthy lifestyle for citizens and that do not have a negative impact on natural features. This section references the Waterfront Master Plan and the Services and Utilities section of the Official Plan.

Open space policies focus on keeping Open space separate from but accessible to other uses. This is accomplished through Parks and Recreation Chapter of the OP. For commercial recreation of open space, the city considers access, compatibility with adjacent lands, environmental protection and stormwater and sewage servicing.

2.3.2.10 Environmental Constraint-Natural Heritage (OP 4.11)

Natural Heritage areas in Cornwall are designated and identified in the index of the OP. They can include swamps and wetlands, woodlots and woodland systems, meadowlands, valleys, habitat areas or any other natural feature that is considered to be of heritage value.These sites are generally unsuitable for development and alteration.

Development on and around these areas is limited and in many cases prohibited. Buffers and other constraints separate Natural Heritage from other land uses to as not to cause any ill effects on any natural features. Where development near Natural Heritage occurs, and Environmental Impact Assessment under the Ministry of Natural Resources is required by the city to study any potential impacts on natural heritage features. The city is able to use tools such as site plan control or site alteration bylaws to implement findings from and Environmental Impact Assessment.

2.3.2.11 Floodplain Natural Hazards (OP 4.11)

Floodplains and Natural Hazards are areas that are unsafe for development due to naturally occurring hazards. These can include slopes that are unstable due to erosion and lands that are subject to flooding. The goal of these policies is twofold: first, they are to protect

citizens from living in potentially dangerous areas and second they are to protect vulnerable landscapes from undue damages. In order to achieve this, development is limited or prohibited in Natural Hazard areas, and buffers and setbacks are used to separate adjacent developments. The Conservation Authority has responsibility to adopt policies to protect these areas in accordance with the Ministry of Natural Resources.

2.3.2.12 Comprehensive Redevelopment Area (OP 4.12)

Comprehensive Redevelopment Policies are applied to large unique sites with high redevelopment potential as a way to encourage redevelopment through incentives such as bonus zoning, and more flexible designation and zoning requirements. A Comprehensive development scheme needs to be completed before any development on designated sites can proceed. Development in these areas need to consider compatibility with adjacent lands. Policy six deals specifically with brownfields, stating that in the event a Comprehensive Redevelopment Area is on a brownfield site, cleanup must be completed in accordance with Provincial standards, and Phase I assessments are required before any development can take place. Phase II assessments may also be required.

2.3.2.13 Future Study Area (OP 4.13)

This designation applies to sites where present land use policies are undefined, incomplete, incompatible or problematic. Secondary plan studies are often required to determine the best land use options. One such potential area is the area east of McConnell, which is the location of at least one brownfield site which was considered in the scope of this project. The goal of the Future Study Area policies is to develop land use policies in designated areas that compliment current land uses in the city, and that maximize existing roads and infrastructure.

2.3.2.14 Prime Agricultural (OP 4.14)

Prime Agricultural lands differ from other agricultural lands in that they have higher grade soil under the Canada Land Inventory for Agricultural Capability. These lands are being preserved for long term agricultural use, and as such development on these or adjacent lands is highly controlled.

2.3.3 Housing (OP 5.0)

The City of Cornwall's housing strategy is made in reference to the City of Cornwall Ten Year Housing Plan. Its goal is to provide a steady supply of high quality housing stock for the city by intensifying and rehabilitating existing housing areas, and by creating well-designed high-quality and sustainable new developments. A three year supply of draft approved lots is required by the city to fulfill its 10 year housing goals. Furthermore, the city stipulates that 20% of growth must occur in built-up areas. The OP contains specific policies for subdivision plans and converting rental properties into condominium housing. In the Downtown and Le Village

areas, a number of policies are aimed at promoting housing intensification by using secondary housing policies bonus zoning and intensification. Cornwall is also pursuing the creation of new types of housing stock in addition to traditional housing types, including using mixed use developments to accomplish the housing goals of the city. This is important because mixed use developments are often a feasible way to develop gas station brownfields located in densely populated urban areas such as a downtown.

2.3.4 Waterfront Planning (OP 7.0)

Because of its location along the St. Lawrence River, and the important lands located on the banks of this river, waterfront planning is important for the City of Cornwall. The city is seeking to promote waterfront areas as places of leisure and public enjoyment where they were once places of industry. A number of parks and other public facilities have recently been built around the waterfront areas to promote public use of the valuable waterfront areas.

In order to reach its waterfront goals, the city has adopted a Waterfront Plan aimed at maximizing the benefit of the river for the residents of Cornwall. Future developments along the waterfront must respect public access to the water and must compliment existing parks and public services on the river that are designed to encourage leisure. This applies to residential as well as commercial and industrial developments. New developments should also avoid disturbing the sediment on the bed of the river as well as avoid any Natural Hazard areas along the banks of the river in accordance with section 4.11 of the OP. The city is placing a lot of funds and resources in promoting the riverfront as a an area for recreation, leisure and tourism that can of benefit to the city. Cornwall's specific waterfront planning documents are explored further in section 2.5 of this report.

2.3.5 Economic Development (OP 8.0)

In section 8, the Official Plan details its approach to economic development. The OP puts focus on attracting people and businesses to the city, while also focusing on the city's culture and arts scene and identity.

For the economic development policies (8.3), the OP starts with ensuring that the supply of land is enough to warrant growth and development, which plays in direct unison with section 3, Growth Concepts and Policies. It places other focus on the physical aspect of the city, such as making sure signage and gateways to the city remain well maintained and attractive to welcome people.

Other focus for economic development are on public open space and waterfront areas, which could also bring in people and entice businesses to open up from the economic opportunity of development and growth. A focus on bringing in and using tourism as an industry is also displayed in 8.3. 10-14. Lastly, local engagement is also a possibility, as 8.3.18 points out that a yearly farmer's market should be considered, and tested for feasibility.

2.3.6 Urban Design (OP 9.0)

Brownfield redevelopment in Cornwall should follow the urban design goals and policies as stated in section 9.0 of the Cornwall Official Plan. The urban design goals as listed in section 9.2 includes, providing multi-functional and multi-modal streetscape network to enhance circulation and mobility, providing a convenient and connected open space network to improve recreational uses, providing a suitable development for the surrounding environment, to develop with sustainability with today's standards, to create a unique identity and distinct markers, and to identify significant locations for gateway entry signs.

Under the Cornwall Official Plan, section 9.3 carries out a list of policies and guidelines for all land use categories to achieve the above urban design goals. Brownfield redevelopment in these categories should also follow the guidelines and policies as stated in the section:

Residential Areas

Brownfield redevelopment in residential areas shall follow all policies stated in section 9.3.1 of the Official Plan. Specifically, to have regards for characteristics and built form of adjacent development, to have smooth transition of different density types, and to encourage the use of underground parking while keeping surface parking to a minimum.

Commercial Areas

Brownfield redevelopment in commercial areas shall follow all policies stated in section 9.3.2 of the Official Plan. Specifically, to follow any building and parking requirements, and redevelopment of corner lot former gas stations for commercial use should be highlighted through height and scale.

Employment Areas

Brownfield redevelopment in employment areas shall follow all policies stated in section 9.3.3. Offices uses should be developed on major streets, industrial uses such as outdoor storages and tanks should be located away from street fronts.

Parks and Public Open Spaces

Cornwall has an Active Transportation Plan that contains recommendations that will enhance and encourage active transportation modes, providing opportunities for brownfield interim uses and redevelopment such as pedestrian amenities or cycling infrastructure.

Streetscapes

Brownfield redevelopment adjacent to 400 series Highway systems should create a highlighted sense of place for Cornwall, it is also encouraged to have landscape planting where necessary. There are also opportunities to improve arterial streetscape, as it is encouraged to have shade trees and plantings, as well as improving street furnishing and increase public art.

Specialty Areas

1. Gateways and Entries
   At major road and highway entries to the city are encouraged to have consistent signage, and substantive public art to promote a sense of place, creating opportunities for brownfield reuses.
2. Downtown and Le Village
   Brownfield redevelopment in these locations shall follow all policies stated under section 9.3.6, subsection 2 of the Official Plan. Specifically, characteristics of infill buildings must be consistent with adjacent buildings.

2.3.7 Cultural, Arts & Built Heritage (OP 10.0)

Defined under section 10.0 of the Cornwall Official Plan, cultural heritage resources are archaeological, built heritage, and cultural heritage resources, which could be buildings, structures, monuments or artifacts that have cultural heritage value or interest. The goals in section 10.2 of the Cornwall Official Plan are to identify such resources using tools and promote its importance, to encourage sustainable use or adaptive re-use of heritage resources, to encourage compatible new development in areas of heritage resources, to seek options for increasing public awareness, to encourage heritage restoration projects, and to enhance these resources to promote tourism.

Brownfield reuse strategies should also seek opportunities wherever possible, to help Cornwall in achieving its goals under this section. It is also important to identify any cultural heritage features on or adjacent to redevelopments sites, and follow policies stated under section 10.3 of the Cornwall Official Plan to protect and enhance those resources.

2.3.8 Services & Utilities (OP 11.0)

Cornwall's services and Utilities policies are focused on providing cost-effective municipal services to all residents in the city. Existing Services and Utilities should be maximized when considering new development options while new Services and Utilities should be constructed under careful consideration of use and feasibility. Service and Utilities policies cover stormwater management (11.4), solid waste disposal (11.5), former solid waste disposal

sites, contaminated sites/brownfields (11.6), municipal water services and sanitary sewers and treatment (11.7), utility corridors (11.8) and fire protection (11.9).

Section 11.6 under this section of the OP deals specifically with Brownfields and more specifically with former disposal sites. It is important to understand the cities stance on other brownfield sites and their policy implications. For former waste disposal brownfields, development requires an amendment to the zoning bylaw and a review by various government agencies. The OP is clear under 11.6.3 that these include “former petroleum resource operations.” A record of site condition affirmed by qualified personnel under provincial standards is required for any development approval. Further brownfields development guidance is to be pursued through the Brownfields Community Improvement Plan.

Cornwall is unique in that its electricity is supplied by Hydro Quebec rather than Ontario. This means that hydro-electricity rates are Cornwall are up to 25% lower than rates for the rest of the province.

2.3.9 Transportation (OP 12.0)

The Official Plan outlines 11 transportation goals that aim to maintain safe, efficient and convenient transportation throughout the city, adopt complete street policies and to develop a continuous street system for more efficient east-west movement, and increased usability. The city’s arterial roads are designed to carry large volumes of traffic and are normally the primary routes for local transit service and trucks in order to organize land uses to keep commercial vehicles off of local streets. The local roads have been designed to provide for local traffic movement and access to the abutting properties they are narrower than the larger arterial roads to discourage non-local traffic. The goals also aim to incorporate more active transportation, as well as public transportation. Additionally, there are policies that guide subdivision plans to provide convenient access to bus routes or be within an acceptable walking distance by requiring a staging of future urban development in relation to the provision of transit service and adequate facilities/improvements to maximize the level of service.

Gas stations have historically been placed strategically at major intersections so as to be accessible to vehicular traffic traveling down major rights of way. These intersections also tend to have a high degree of pedestrian traffic, and therefore, their location makes them attractive areas for development. Diversity and access to transportation plays a key role in the success of a brownfield site and may influence developer interests on remediation and redevelopment.

2.3.10 Sustainable Development (OP 13.0)

Cornwall is guided by a sustainable approach for development by incorporating higher densities and mixed uses, active and public transportation, risk-averse stormwater management practices, and conservation measures. The goals encompass ecological, economic and social sustainability. The City aims to retrofit older buildings in order to conserve energy, as well as

update efficiency standards for new developments. While the City of Cornwall also promotes the creation and use of renewable energy, which has the potential to reduce gas-based energy use, no other plans add more incentives and guidelines for renewable energy in the city.

Unfortunately, the sustainability section fails to address brownfield development, leaving it to fall under economic development. While implementing strategies to redevelop a brownfield, pre-existing structures should be evaluated to be reused, retrofitted, or expanded to pursue the vision of innovative strategies.

2.4. Cornwall Downtown Vision

The Business Improvement Area (BIA) is managed by a committee of business owners and community members whose mandate is to build up the downtown areas, and promote downtown businesses. Cornwall has two areas that are considered Business Improvement Areas; The Downtown and Le Village. The Downtown is centered on Pitt Street and is the traditional central business district. Le Village is located in the east end of the city and is a business strip located on Montreal Street with French influences. The vision for Cornwalls downtown area, as detailed in the City of Cornwall Official Plan (2018) and the Heart of the City Community Improvement Plan (2014) (HCIP), aims to strategically redevelop downtown areas to stimulate the economy and boost recreation. Cornwall's 20 year vision sees an "animated [and] pedestrian friendly" downtown (City of Cornwall, 2018).

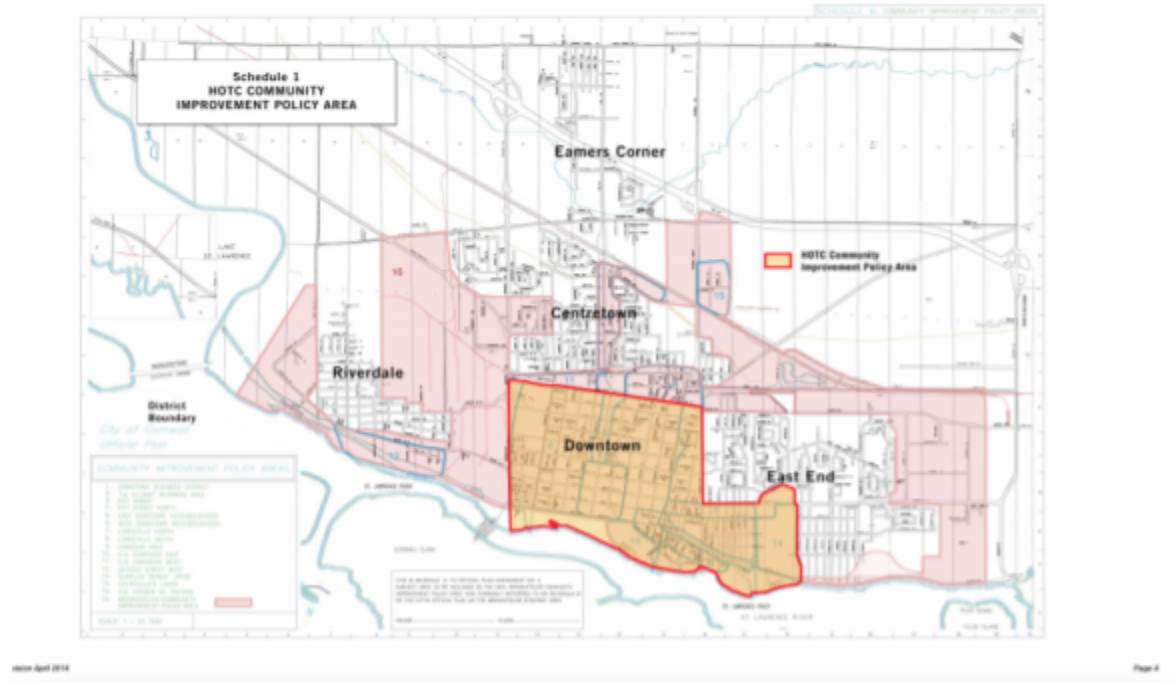


Figure 1. Relative location of Cornwall's Downtown. (City of Cornwall, 2014)

The Centretown Streetscape Plan (2012) was implemented to unify the visions of the BIA and the Heart of the City initiatives and has six guiding principles:

1. Create a cohesive identity for Centreville
2. Ensure connectivity
3. Promote Cornwall as a gateway and a hub
4. Enhance core area aesthetics
5. Embrace the heritage
6. Promote arts and culture excellence

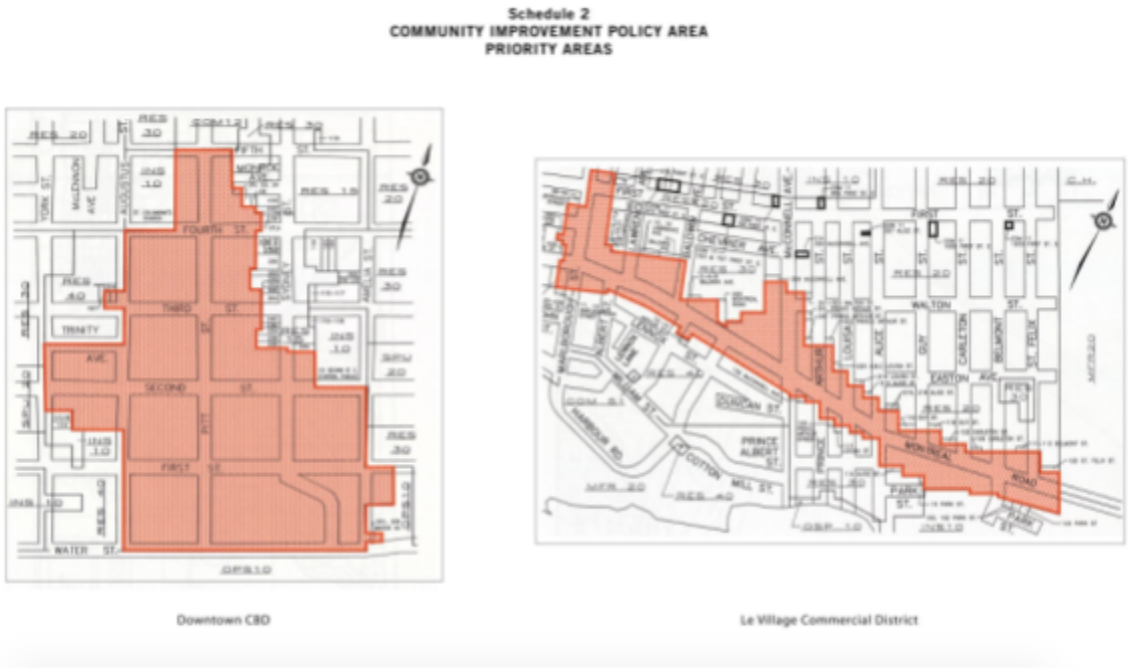


Figure 2. Downtown and Le Village BIA (City of Cornwall, 2014)

Cornwall's HCIP is designed to compliment the Cornwall Brownfields Program (refer to section 3 of this report), and lays out specific incentives and goals aimed at promoting redevelopment in the downtown areas (City of Cornwall, 2014). The Downtown and Le Village are seen as the priority areas for implementation of these programs. The three goals of the HCIP are:

1. Develop priority projects
2. Promote access to the waterfront
3. New commercial and residential developments

The HCIP identifies unique development challenges and opportunities for Cornwall's downtown. Due to an aging population, there is a market for "niche" lifestyle housing for retired

and elderly people. Furthermore, the proximity to the waterfront and the main shopping area makes this an attractive area for development.

The HCIP offers a number of financial aids and incentives aimed at helping landowners and business owners improve their properties and businesses including a façade improvement grant and building restoration improvement loan. These policy initiatives may prove useful for potential fate of a brownfield (City of Cornwall, 2014).

The HCIP financial aids and incentives:

- **Rehabilitation Tax Increment Grant Program**
  - The owner is reimbursed all or part of municipal tax increase for improvements made to a building
- **Building Restoration and Improvement Program**
  - A forgivable or interest-free loan of up to 50% of cost for interior improvements for buildings to a maximum cost of $30,000
- **Project Design Grant**
  - A grant of up to 50% of feasibility studies or architectural drawings to a maximum of $7,500
- **Façade Improvement and Sign Grant**
  - Up to $10,000 to cover 50% of the costs of façade improvements and $2,000 for new signage
- **Municipal Planning/Development Fees Grant**
  - Full refund to landowner for OP zoning amendments and Building Permits
- **Discretionary Municipal Tipping Fees Grant**
  - A grant of 50% of the assigned fee given to the developer to reduce dumping fees for non-hazardous waste at the local landfill site.
- **Parking and Landscape Enhancement Program**
  - A maximum of a $25,000 interest free loan per property owner over 10 years applied to projects that include parking or landscape enhancements or related amenities such as seating.
- **Le Village Residential Façade Improvement Grant**
  - As part of the implementation of the Centretown Streetscape Revitalization strategy up to $10,000 amounting to 50% of the costs for façade improvements.

The core of the downtown is also home to various renaissance initiatives in the Renaissance Community Improvement Area. Key players such as Groupe Renaissance and Le Village Business Improvement District fund community and non-profit initiatives to revitalize the downtown waterfront area.

2.5. Cornwall Waterfront Vision

The City of Cornwall is located along the St. Lawrence River. It is approximately 1,179 km long, flowing to Lake Ontario and the Gulf of the St. Lawrence on the east coast of Canada (Marsh, 2015). The City of Cornwall Waterfront Plan (2007) is currently under-review. The waterfront is recognized as a prime tourist location and enhancement of the open space system and development of passive and active recreation corridor is a planning goal. A portion of the waterfront falls into the Heart of the City and Renaissance community improvement areas. Waterfront development is meant to be strategic and innovative encouraging connection between adjacent neighbourhoods.

Cornwall's Waterfront Vision in the City of Cornwall's Official Plan (2018) outlines eleven goals for the waterfront area:

1. Foster a beautiful and vibrant waterfront achieved through strategic enhancements and high-quality built form and urban design
2. Improve public access, and increase the year-round use and enjoyment of the waterfront
3. Maintain and enhance the continuous, open space system along the waterfront which links major park areas and allows the development of passive and active recreation areas and corridor recreation activities such as cycling, cross-country skiing, jogging and strolling
4. Recognize the waterfront as a potential tourism resource and encourage appropriate tourist projects and facilities on suitable sites
5. Increase the recreational use of the River within the City
6. Continue to improve the visual image of the waterfront and encourage innovative development and design on or adjacent to the waterfront
7. Ensure that waterfront development is compatible with, supportive of, and well-connected to adjacent districts.
8. Protect environmentally sensitive features and areas along the waterfront and direct development away from hazardous lands and natural hazards.
9. Prevent through the adopted Cornwall Sediment Management Strategy the disturbance of contaminated sediment in the river bed of the St. Lawrence.
10. Recognize the historic importance of the waterfront.
11. Protect potential Marine Archeological resources in the St. Lawrence River such as former historic docks and piers.

Within the Economic Development Strategic Plan (2016), new actions have been outlined. Following the update of Cornwall's Waterfront Master Plan, the City is pursuing local ownership of waterfront land which is currently owned by the federal government (McSweeney, 2016). There is potential for nearby brownfield sites to be key in connecting the waterfront and

Le Village in sustainable and innovative ways (City of Cornwall, 2018). The proximity to a prioritized waterfront can increase property value, increase foot traffic and business opportunity.

Figure 3. Aerial View of the Cornwall Waterfront (ChooseCornwall.ca)

2.6. Cornwall Rural Vision

Rural has been defined as the population living in towns and municipalities outside the commuting zone of larger urban centres such as the areas outside the City of Cornwall's municipal boundaries (Du Plessis & Clemenson, 2001). The City is largely rural in character, with lands outside the downtown core maintaining low densities. City policies aim to maintain this character, while focusing development into downtown Community Improvement Areas, such as the Heart of the City and Renaissance area.

Many of Cornwall's former gas station brownfield sites are located in the rural area, where population density is low. Currently some uses for previous brownfield developments within these areas are large storage spaces for industrial or agricultural industries, as well as parking area for RV mobile homes (ie. Vincent Massey site). Compared to the downtown there are fewer funding resources for brownfield revitalization and no community improvement plans.

3.0 Brownfield 101

A brownfield is a piece of vacant or abandoned land, that may have the presence of contamination in the soil or is likely to have had contamination (Pennsylvania Department of Environmental Protection, 2014). The definition of a brownfield site is broad and general, as there are many different types, such as: former gas stations, old dry cleaners, car repair facility, former military base, power plants, manufacturing plants, aviation facilities, abandoned railroads or foundries. Former gas stations are a common type of brownfield site that is found across North America, as the storage of gasoline often leads to various chemicals leaching into the soil, creating a contaminated lot.

Brownfields are common throughout suburban and urban areas and pose a risk to society on an individual, economic and environmental level. An advantage of developing a brownfields site, such as a fuel station, is that there may be existing infrastructure such as water and sewer lines, electricity connections, road networks and accessibility to public transportation - all aspects, of a development proposal, that need to be taken into consideration. Brownfield development has the potential to reactivate a neglected lot of a neighbourhood and with the opportunity to increase cultural, historical, economical, social and environmental. After an environmental assessment is completed on the property, a better understanding of the contamination level is achieved, and the potential liability can be reduced.

As the City of Cornwall welcomes new residents and developments, the community strives to adapt and evolve alongside. New economic and cultural changes through the reactivation of brownfields present the opportunity to create a more vibrant, social and economic hub across the municipality. Taking into consideration the prime locations of many former gas stations, and the best practices of urban planning, it has become progressively important to revitalize these blight sites. Unfortunately, municipalities and developers will often choose to invest in a greenfield site over a brownfield site furthering sprawl and suburbanization due to unknown remediation cost. The Canadian Institute for Environmental Law and Policy, highlight the importance of using a series of legislative and regulatory reforms which have been introduced to encourage the redevelopment of brownfield sites.

As growth in the city continues, challenges, alongside opportunities, will be faced in the remediation of a brownfield site; however, the long term benefits will outweigh the challenges.

The use and redevelopment of a brownfield site cannot occur until the site has been remediated to appropriate standards of the use (Pennsylvania Department of Environmental Protection, 2014). Additionally, an abandoned or derelict brownfield site harbours ecological biodiversity and can provide habitats for species within the urban realm, while raising awareness and maintenance of environmental damage.

Moreover, a combination between government incentives and a municipality's Community Improvement Plan can aid in alleviating some liability pressures while motivating developers to financially invest in the improvement and redevelopment of a brownfield site.

3.1 Shrinking Cities

Shrinking cities are characterized by an abundance of abandoned, vacant, and brownfield lots (Nefs, Zasada & Haase, 2013) and are considered relevant practices because of how they tackled their abundance of brownfield locations. Shrinking cities are areas that were once densely populated but are now experiencing significant population loss due to the out-migration of younger individuals and families. The rapid industrial expansion, such as the case in Cornwall, brought an influx of population and jobs, but rising labour and energy costs forced large plants to close and move their business elsewhere leaving toxic wastelands behind. Challenged with a stagnant population, growth strategies can be found in shrinking city populations.

Niagara Falls between Ontario and New York State , share a natural wonder that attracted large industries that have now left. Each city implemented different strategies in dealing with declining populations and brownfield lands. Ontario had provincial involvement that implemented incremental planning strategies and private investments to help boost their population and economy which allowed for slow but constant growth. New York State, unfortunately implemented unrealistic “showcase” planning strategies and urban renewal projects that were not feasible, because of this Ontario was successful whereas New York State was less successful (Hartt & Warkentin, 2017).

Although shrinking cities pose many challenges, they also come with opportunities such as expansion of open space that can be integrated into an urban green space network, (Lyman, 2008), increase recreation areas and quality of housing stock, and availability for urban farming (Nefs *et al.,* 2013). Brownfield lots waiting for redevelopment could also be transformed into temporary or interim uses increasing the potential of the site, making it more aesthetically pleasing, and economically beneficial (Dubeaux & Cunningham Sabot, 2018). Since shrinking cities are riddled with an abundance of vacant, brownfield lots and an innovative and cost-effective technique to help clean the contamination of these sites is through phytoremediation.

Phytoremediation can enhance degradation and remove contamination from the soil, sediment and groundwater, but the cost and effectiveness are site specific (Vangronsveld, Herzig, Weyens, Boulet, Adriaensen, Ruttens, Thewys, Vassilev, Meers, Nehnevajova, van der Lelie, & Mench, 2009). Alain D’Aoust from the Ecological Design and Education team for the City of Cornwall indicated that a soil test can identify the native plant species best suited to treat the contamination. As an example, D’Aoust saw success in extracting lead from a 2-acre field using primarily wild mustard, a plant native to the site. The brassica family has proven success

in heavy metal extraction and D'Aoust saw success on his study site. For petroleum sites, D'Aoust outlines a number of species proven to assist on remediation such as, annual ryegrass, sorghum, ground clover, willows, mulberry trees and certain species of maples to assist in remediation. As previously mentioned, there is limited application with phytoremediation and appropriate species of native plants depends on the source and level of contamination. A limiting factor when using plant species for remediation is the rooting zone may not be as deep as the contaminated soil (Vangronsveld, *et al.,* 2009).

3.2 Remediation Policies & Record of Site Condition

Brownfield sites are particularly challenging as their degree of contamination is hard to assess without conducting an Environmental Site Assessment (ESA). Sites that were formerly used as gas stations, dry cleaners, and other commercial retail operations that may cause contamination are required to complete a Phase One and Phase Two environmental assessment in order to satisfy requirements for the Record of Site Condition. For any prospective brownfield development, acquiring a Record of Site Condition is an important milestone that confirms the concentration of contaminants on site are at satisfactory levels appropriate for its new use per the Soil Ground Water and Sediment Standards 2011. If the site has more than one proposed use then the site condition standards for the most sensitive use will apply. The process is regulated by the Ontario Regulation 153/04 which outlines the requirements and conditions. The Record of Site Condition can also reduce potential liabilities for property owners, municipalities, creditors, remediators and other groups as the Government of Ontario has passed legislation limiting liability associated with brownfield redevelopment (Ministry of Municipal Affairs and Housing, 2007). For many of these former gas station sites, owners' priorities are to have absolute certainty that the contamination has been addressed before selling. Ontario Generic Standards set a foundation for environmental and health risk prevention. The standards are based taking two factors into consideration: intended use and certain physical characteristics of the property (City of Toronto, 2019).

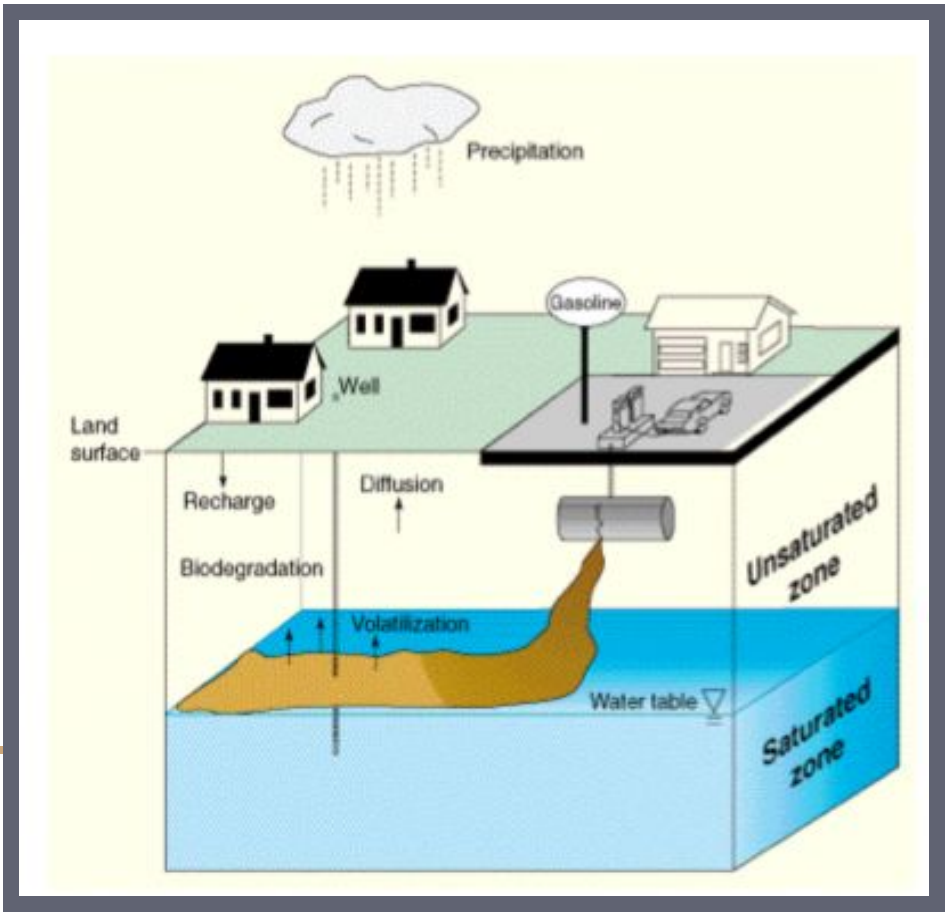


Figure 4. Light non-aqueous phase liquid released from gasoline storage tank floating on the groundwater table (USEPA, 2010).

Depending on the level and depth of soil contamination, there are different related risks through direct contact, inhalation or ingestion, and groundwater contamination through leaching, off site migration and runoff to nearby surface waters or ecosystems**.** Different types of contaminants will affect the soil and/or groundwater. Specifically for gas station sites, light non-aqueous phase liquid, such as gasoline, diesel, and other petroleum hydrocarbon products, will float on the groundwater table and metals will bind to the soil (United States Environmental Protection Agency (USEPA), 2010). Strategies to create barriers from the contamination include building impervious asphalt caps over the area, rerouting contaminated runoff to appropriate stormwater facilities, passive or active depressurization systems and ground water mitigation barriers (USEPA, 2010).

However, even after an ESA is done, it is not until breaking ground that the degree of contamination can be fully determined, and an accurate cost of remediation can be given. Prior to breaking ground, the potential liability issues with the gap in knowledge for the real value of a brownfield site is unclear. Upside down properties are sites that are in debt because they have to be remediated for development - this causes brownfield owners to hold onto their site, as they only have to pay low taxes, and wait until the value of the land goes up to justify remediation costs. This is a main reason why brownfield sites remain dormant and empty. Many municipalities have adopted financial incentive tools to help offset the costs of some of the environmental assessments and incentivize owners to initiate redevelopment. The environmental assessment requirements as stated by the Ontario Ministry of the Environment and Climate Change (MEC, 2014) are as follows:

Phase One Assessment:

- Identify any potentially contaminating activity in the phase one study area, including the phase one property
- Identify areas of potential environmental concern on the phase one property
- Determine if a phase two environmental site assessment is needed (for some types of property uses and circumstances, a phase two environmental site assessment is mandatory)

(MECC, 2014)

Phase One of a brownfield site is to retain an Environmental Site Assessment (ESA) to ensure that there are no immediate risks or concerns of further contamination, in particularly to ground water or adjacent properties. Once an ESA is completed, identifying areas of concern, which may need more attention or an area with a high concentration of contamination, is critical to ensure proper safety regulations and standards are met. For Phase Two, however, the assessments are usually not conducted until the property has sufficient development potential to motivate property owners to sell or redevelop.

Phase Two Assessment:

- Determine the location and concentration of one or more contaminants
- Take actions to reduce the concentration of one or more contaminants if a standard has been exceeded and/or complete a risk assessment to develop property specific standards that are safe for the intended use
- Confirm that the site meets the applicable site condition standard or a standard specified in a risk assessment
  (MECC, 2014)

Risk assessment is derived from the likelihood that contamination on site will cause harm to people, animals, and plants by evaluating how they may come into contact with a contaminant (Ministry of the Environment and Climate Change, 2014).

Rather than meeting generic standards, property owners can use a property-specific approach that uses the conditions of a property and intended use to calculate risk. In addition, it may present engineering or land-use controls to manage risk on the property. It is a more complex process that requires collaboration with the Ministry of the Environment and Climate Change to appropriately approach the risk assessment and ensure adequate consultation with local stakeholders, but in some cases is the more viable option for sites that are not able to meet generic standards.

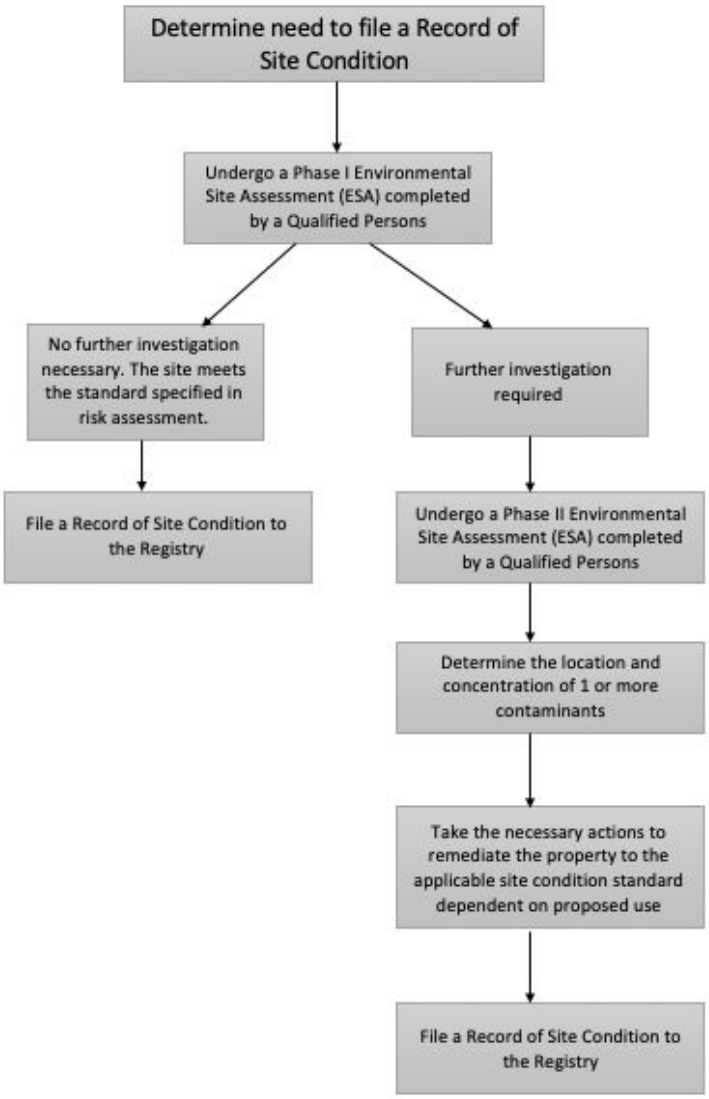


Figure 5. Flowchart of the Record of Site Condition Process (MECC, 2014 - organized by Irene Patrinos)

3.3 Cornwall Brownfield Community Improvement Plan

Cornwall's existing brownfield programs are intended to allocate municipal resources to effectively promote the redevelopment of valuable brownfield sites to a function that suits the changing needs of the city and region at large. The Cornwall Brownfield Community Improvement Plan (BCIP) encompasses eight incentive programs that offer financial support to owners and prospective developers. Without any incentive programs, a large portion of brownfield sites would not be developed at all and would be left to idle until they had substantial development potential from the owner's perspective. While the municipality is eager to offer financial support wherever possible, the use of incentives should not exceed the cost of rehabilitation.

The programs available to brownfield site owners under the BCIP are:

City of Cornwall Rehabilitation Grant Program reimburses the developer an annual grant equivalent to all or part of the municipal portion of tax increase assuming the developers pays the full cost of redevelopment and the resulting property tax increases. The grant amount is based on the total site remediation cost and is given to the developer over a maximum period of 10 years. If the total site remediation costs exceed the payment of 10 years, excess amounts are not given to developers since the annual payment cannot exceed the increased municipal tax, this portion of the grant is retained by the municipality which is used to fund other brownfield initiatives. Many other cities use these grants such as Toronto, Kingston, Guelph, or Niagara Falls. These grants are also widely used in the U.S., municipalities in about 49 states have proven successful in using tax increment-based grants (City of Guelph, 2010).

Environmental Site Assessment (ESA) Grant and Project Feasibility Study Grant Program provides sites with a Phase 1 ESA assistance to determine extent of contamination through partial funding of Phase 2 and 3 up to a maximum of 50% of the study cost.

Brownfield Property Tax Cancellation Assistance Program cancels increases on any property taxation from before and after remediation, which includes both the municipal and educational portions of tax increase. The cancelation of any tax can be commenced at any time as specified in the by-law but can only be applied after the approval of the requested by-law under this program to cancel the educational portion of taxes from Minister of Finance.

Municipal Brownfield and Urban Information Service Program allows the municipality to develop a database of brownfield sites and ultimately to determine which sites have the greatest potential for redevelopment.

Discretionary Municipal Tipping Fees Grant Program provides some relief on costs of removal and disposal of non-hazardous materials at local landfill.

Municipal Property Acquisition, Disposal and Marketing Program is a program where the municipality purchases and sells/leases property for redevelopment efforts.

Payment-in-lieu of Parkland Dedication Program gives an exemption on cash-in-lieu for parkland where land dedication isn't feasible.
(City of Cornwall, 2015)

While there are many programs present, the overall availability of funding for BCIP are constrained and would benefit from more direct funding from the provincial and federal levels of government to offset the perceived unpredictability of brownfield development. As will be discussed in the international example's component of the report, jurisdictions in the US are able to apply for large subsidies from the Environmental Protection Agency at the federal level to provide the necessary financial and technical assistance to promote the widespread development of brownfields.

3.4 Province tools & International tools

In Canada there are funding initiatives at different provincial levels but there is also funding across the national level through the Federation of Canadian Municipalities (FCM).

3.4.1 Brownfield Financial Tax Incentive Program

In Ontario, the Ontario Brownfield Financial Tax Incentive Program (BFTIP) is a direct foundation for many of the municipal tax cancelation assistance programs, which is responsible to remove all or portion of the property tax increase resulted from brownfield remediation. At the municipal level, this program allows municipalities to provide property tax assistance and apply to the province for the matching education portion to increase the amount of assistance provided to a brownfield redevelopment for up to three year. The property owner must apply first at the local municipality for the tax cancelation assistance program, then on the behave of the property owner the municipality is to apply at the Minister of Affairs and Housing for approval of cancelation on the matching educational property tax portion (Government of Ontario, 2018). To be eligible for BFTIP the property must first have a phase two environmental site assessment completed which states that the site requires environmental remediation. The difference between a BFTIP and tax incremental-based grants (TIG) is that TIG programs provides grants

to the developer based on the tax increase instead of a tax cancelation on the tax rolls for a BFTIP (Government of Ontario, 2018).

3.4.2 Federation of Canadian Municipalities

The Federation of Canadian Municipalities includes members of more than 2,000 municipalities across Canada and represents almost 90% of all Canadians (FCM, 2019). The FCM has programs to fund various types of brownfield sites such as the Green Municipal Fund, Brownfield Site Redevelopment Funding, Site Remediation or Risk Management and the Community Brownfield Action Plan. The Brownfield Site Redevelopment fund provides funding for pilot project initiatives that have potential to bring brownfield sites into productive economic use, and the funding is delivered in the form of a grant of up to $350,000 (FCM, 2019). The Site Remediation or Risk Management program provides funds for initiatives to bring brownfield sites back into productive economic use, and the funding is supplied as a low interest loan with loans provided on a project-to-project basis (FCM, 2019). The Community Brownfield Action Plan provides funding for the development of a plan to identify and prioritize opportunities to revitalize a community's brownfields, and the funding is a maximum of $175,000 (FCM, 2019). The Federation of Canadian Municipalities allows for not only municipalities to apply for the funding, but also municipalities project partners such as private developers, municipally owned corporations, non-governmental organizations and indigenous communities (FCM, 2019).

3.5 Government Support Financing Practices

Funding for brownfield remediation varies provincially and internationally. Additionally, a set guideline for brownfield funding does not exist**.** The funding of brownfields in Canada can be supplied from the Federal Government to the Provincial Government to disperse the funding that may vary from province to province. International financing strategies for brownfield redevelopment will be examined in this section through some European funding initiatives and North American funding initiatives.

3.5.1 European Funding Initiatives

In Europe, brownfields are managed and funded by a combination of European Union (EU) legislation and funding, country-specific policy and private-public partnerships. Brownfield funding and remediation in the EU are governed by the European Environmental Agency (EEA) through the European Union Thematic Strategy for Soil Protection (Vandheusden, 2007). National funding strategies are rare because they are difficult to implement, and it must be compatible with the "common market" (European Environmental Agency, 2008). Furthermore, the EEA has adopted a "polluter pays" policy meaning that remediation costs are to be borne by the polluter. In cases where the polluter cannot be identified or cannot be legally made to bear the costs of remediation, funding is made available to offset the costs of remediation. Brownfield funding is available from the European Union and is based primarily on economic development, meaning that there is a limited amount of brownfield-specific public funds than in Canada.

The largest fund used in brownfield remediation is the European Regional Development Fund (ERDF) which is part of the larger EU Cohesion Fund (European Commission: Urban and Regional Development, 2013). With a budget of EUR 250 million, this fund is aimed at reducing economic imbalances between regions within the EU by funding growth in less developed regions. European Regulation No. 1301/2013, Article 5 specifically mentions brownfield remediation funding. National brownfields funding strategies focus on investigating contamination on sites (European Commission, 2017). For example, Hungary's OKKP funds the investigation and assessment of contaminated sites (EUGRIS, (n.d.)). By contrast, Cornwall's Brownfield Program only funds 50% of site investigation up to $15,000 (City of Cornwall, 2015).

Finland has one of the only state sponsored brownfield-specific funding programs in Europe. Brownfield remediation costs can be supplemented through the Finnish Oil Production Compensation Fund (Finnish Ministry of the Environment, 2019). This fund was established to compensate the cost of oil spills at land and sea where the polluting party is unknown or unable to bear the remediation costs. This fund does not remove liability from the polluter because it is funded through fees levied on oil being imported to or through Finland.

Brownfields funding strategies in Germany take a public-private partnership approach (Meitl, 2015). Under the Federal Soil Protection and Contaminated Sites Ordinance, the federal states are responsible for acquiring brownfields and giving greater control over remediation. Public funds from various levels of government in Germany will compensate much of the investigation into soil remediation, but the actual work of remediation is borne by the public sector and is guided by the principle of polluter liability. Dortmund's Phoenix-See project is an example of a publicly funded private development of publicly owned land. This strategy more closely resembles the funding scheme for projects such as the Cotton Mills in Cornwall.

The European Union funding model for brownfields is a top-down approach focused on economic development, and it's guided by the "polluter pays" principle. Brownfield funding in Europe is based on reducing regional economic disparity, furthermore, resulting in less brownfield-specific funding programs than in Canada. While many funding initiatives in Canada are based on economic development, they tend to be offered by municipalities and not from the federal government. Ultimately, the "polluter pays" principle, states that liability means financial responsibility. This leads to less private funding of remediation projects in Canada.

3.5.2 North American Funding Initiatives

The United States of America introduced the Small Business Liability Relief and Brownfields Revitalization Act in 2001, which combined two previous bills known as the Comprehensive Environmental Response with the Compensation and Liability Act. This bill provides liability protection for potential buyers, neighboring property owners and sanctions funding for both state and local programs to assess and clean up brownfields (EPA, 2017). The

Act authorizes up to $200 million per year for brownfield assessment and $50 million per year for sites with petroleum contamination, with grants of up to $200,000 per site (EPA, 2017). There is also $50 million per year for grants to assist states with development of state programs (EPA, 2017). Before this bill was introduced, the present landowners or operators of a contaminated property were held responsible for cleaning up contamination even if they were not the ones responsible for said contamination. This had a negative effect on redeveloping brownfield sites causing businesses and developers to avoid brownfield sites (The White House, 2002). This bill had a direct effect on future developers and purchasers of brownfield sites, as they would not be held liable for the contamination of the site and could be eligible for funding to remediate brownfield sites. Most of the funding comes from the United States Environmental Protection Agency to state governments who then distribute the funding accordingly (EPA, 2018). Some of the brownfield grants are: Brownfields Assessment Grant, Brownfields Revolving Loan Fund Grants, Brownfields Cleanup Grant, Multipurpose Grants, Technical Assistance, Training and Research Grants (EPA, 2018). These grants help with some funding of remediation of contaminated sites but also provide technical assistance and job training activities. The funding initiatives vary from state to state but also vary from country to country.

4.0 Evaluation & Prioritization

Before any prioritization of Brownfield sites can be accomplished, it is important to know what possible interventions exist for these sites. Not every site is viable for immediate redevelopment, but often land values can be increased through less intensive options. This section will first describe the brownfield intervention options, then examine methods for prioritizing and evaluating the best sites when faced with many potential properties.

4.1 The Four Fates of Brownfield Sites

There are four main reuse approaches for former gas station brownfield sites - each with varying project costs, benefits and challenges. Reviewing the various site development potential, relevant municipal financing programs and other site characteristics, can help to determine which reuse options are most suitable. The four fates from least to most financially dependent are: no intervention, beautification, interim use and property redevelopment. One of the most difficult aspects of brownfield management is determining what type of intervention is appropriate for a given site and which sites should be prioritized over others. It is imperative to determine the future use of the site as there may be different standards of remediation required, depending on how the land will be used. For example, an asphalt parking lot may not require remediation to be safe whereas an in-ground swimming pool or park may need major remediation.

4.1.1. Option 1: No Intervention

In circumstances where there are high or uncertain levels of contamination, taking no action can be an appropriate response to a brownfield site. If a prospective site is far removed from areas of development or faces high remediation costs, then its perceived development potential may be too limited to spur the interest of investors or owners. Given the limited municipal resources available to incentivize brownfield development, the municipality and property owners are inclined to support projects that are economically feasible and provide a degree of certainty that there will be limited liability associated with the reuse of a given site. Furthermore, high levels of contamination can be very difficult to remediate to the appropriate environmental standards should the new use be more sensitive, such as a residential or recreational use.

Pros	Cons
● No initial and maintenance costs	● Does not enhance social capital ● Decreases value of adjacent properties ● No return profit ● Environmental contamination remains

4.1.2. Option 2: Beautification

Beautification refers to the process of removing all visual signs of deterioration or degradation on a vacant site. Such sites can have a negative impact on the overall aesthetic of its surrounding area and can influence the values of adjacent properties. A study conducted at the University of Cincinnati looking into the financial impact of brownfields on nearby property values found that “for each 1 percent nearer to a brownfield a residential property stood, the value of the house depreciated nearly .1 percent” (University of Cincinnati, 2013), representing lost property tax revenue for the municipality.

This process aims to mitigate the visual and physical impacts of vacant brownfield sites by enhancing the aesthetics through public art and/or landscaping features. Not only will that have a positive impact on the quality of the public realm, but it can also serve as an opportunity to engage the local community in beautification efforts that simultaneously achieve a placemaking function. The cumulative benefits of beautification and placemaking can translate to increased property tax revenue, a stronger sense of community identity and reinvigorated economic development.

Landscaping as a form of beautification can also achieve the benefits of passive remediation through phytoremediation. Although phytoremediation is not the preferred remediation method for projects focused on efficiency and environmental certainty, it is an environmentally sustainable approach that can lead to the breakdown of pollutants on sites with moderate and low levels of contamination over the long term (Fatima, 2017). For sites that will remain vacant for extended periods of time, passive forms of remediation can have a pronounced effect on the degree of contamination that will need to be addressed when future development occurs.

Beautification is an approach that can be adopted on a large number of sites, regardless of their immediate development potential, as it can be achieved at a fairly nominal cost relative to the social and economic benefits it can offer the municipality and community at large. The limited liability to the owner or party responsible for maintenance in the instance of beautification is an important benefit of beautification. Access to the site can be restricted because it is not being actively used.

This process can also be leveraged to attract greater interest in a more prominent interim use, especially in instances where the current physical and market conditions of the site is not yet profitable. The temporary uses can “create opportunities for longer term and lower input restoration” in order to adequately “demonstrate value sufficient to justify the investment required to achieve the re-use” (Bardos, 2016).

Pros	Cons
● Improving the aesthetic of the site ● Minimal initial cost ● Easy to implement ● Application does not depend on contamination level ● Influences value of adjacent properties ● Creates stronger sense of community identity ● Harnesses site potential to attract greater investment and encourage future development	● High maintenance costs (relative to profitability) ● Financial feasibility due to low/no return profit ● Limited community utilisation of site ● May be perceived by the public as waste of tax money ● Revenues likely too low to offset remediation costs

Figure 6. Beautification under Pennsylvania Horticultural Society's LandCare program (Next City, 2018)

Examples of beautification

In Liepzig, Rall and Haase (2011) have studied the longer term impacts of the greening of brownfields. Their study found that the beautification technique led to higher usage rates for dog-walking, walking and sitting. In some cases they can act as useful shortcuts through the city if footpath access is provided. This is verified in other research where De Sousa (2009) noted a number of users' personal and community benefits experienced. Their study concluded however that public acknowledgement of the involvement of the local government in beautification strategies in Leipzig were low, and therefore better engagement was required in order to a) increase potential as an urban planning tool and b) strengthen the willingness of local people to participate in site (re) development.

Addressing the negative perception

The other issue to address when advocating for beautification strategies on urban brownfields is ensuring that both the public and other stakeholders are aware of the market and outside forces at play in determining the short-term future of a site. Where a municipality has acted to *only* beautify a site, the reasons should be publicly distributed in order to avoid criticism which suggests that the site is being ignored or intentionally concealed. However, in most cases, beautification strategies are designed for community benefit and to reduce/remove a public blight. In such cases, public support is generally strong. For example, in interviews on public perception of urban greening, De Sousa (2014) found that where public green space had been created on brownfields, end users 'did not even remember what had been there before the green space' (p.1064) and were therefore supportive of such schemes.

4.1.3. Option 3: Interim Use

Interim uses are programed activities on a site that are temporary or not intended as a final use. Interim options are generally used in cases where it is not feasible to fully remediate the contamination, yet the site still presents opportunities for temporary use which can facilitate economic development. Examples include creating open public spaces, community gardens, areas for concerts, farmers markets or even temporary parking areas. The purpose of an interim use is to animate a vacant lot without pursuing permanent redevelopment. Beautification is often involved. Interim uses can have a positive impact on property values by activating spaces and demonstrating the potential of the brownfield site.

Interim uses can be an effective means of combating brownfield idleness whilst generating economic activity and facilitating future full-capacity land use. They can provide a phase-based development solution for particularly challenging brownfields where further investigations may be required to determine their viability for long-term redevelopment. Often interim uses can help in bringing land values to a level were redevelopment becomes feasible. A good method of doing this is movable displays or activities. For example a wooden planter garden can be moved from one brownfield to the next as they redevelop, maintaining community engagement, keeping idle brownfields active, and increasing land values.

Pros	Cons
● Helps to build social capital and foster community engagement ● Convenient temporary use (with a view to securing permanent redevelopment) ● Diverse low cost effective options (ex.phytoremediation) ● Encourages economic development ● Creates stronger sense of community identity ● Attracts greater investment ● Influences value of adjacent properties ● Flexibility of uses and changes	● Initial and maintenance cost (higher than beautification) ● Unknown risks of personal liability become a concern ● Various passive remediation methods require longer time frames to be effective

A variety of successful interim uses have been deployed upon urban and suburban brownfields. One example is an urban farm is *Lynchburg Grows* situated on brownfield land in Lynchburg, Virginia. Local colleges and schools assisted in the clean-up of the 7-acre site, volunteering during an 18-month clean-up project which involved the clearance of a number of large dilapidated greenhouses. Once levelled, a number of lower-rise green-houses and temporary hoop-houses were situated on the site, within which were raised planters containing organic soil (comprising local food waste from Lynchburg schools and businesses). This avoids the issue of growing crops from the contaminated soils of the site. Whilst contributing locally sourced fresh produce to nearby schools and restaurants, the site is also home to a small public greenhouse/garden for public enjoyment and has a long-term lease.

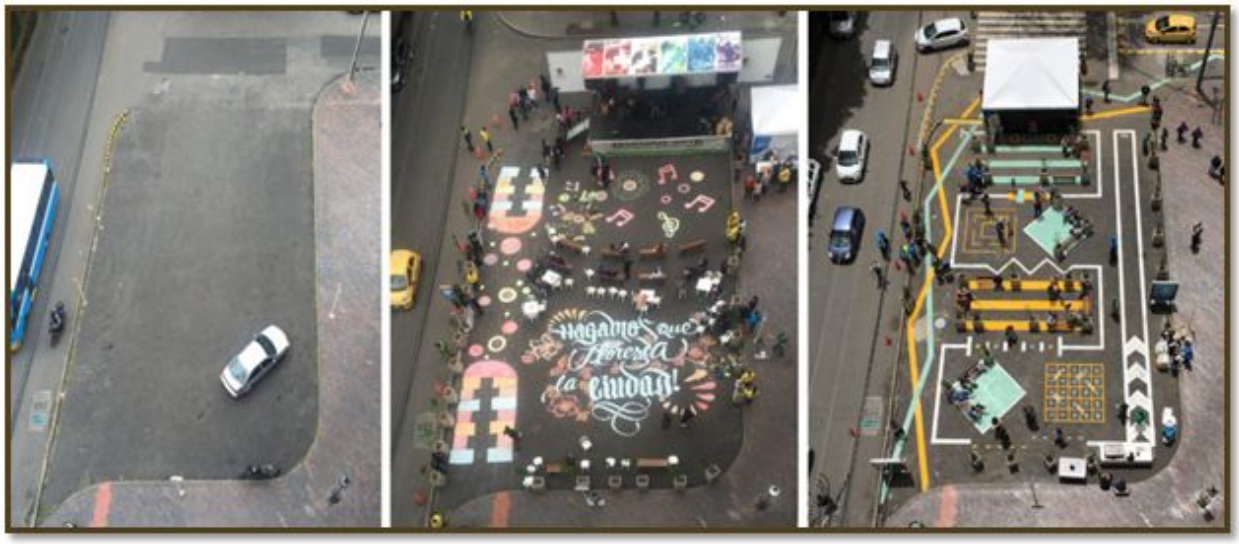


Figure 7. Plazoleta Program in Bogotá Columbia that aims to activate vacant space (Global Designing Cities Initiative, 2019).

Elsewhere, the Plazoleta Programme in Bogotá is a contrasting precedent of an interim use, where a vacant parking lot has been transformed into a multi-use public space with seating, play-areas and planters. The program also addresses a road-safety issue, where previously the plot was being used as a short-cut by drivers to avoid a busy road junction. The road-safety aspect of the program has been developed into an education scheme for children where they are taught cycling proficiency on the site (Urban Think Tank, 2017). Imagination and innovation are key in creating effective interim uses.

4.1.4. Option 4: Redevelopment

Redevelopment is the removal or rehabilitation of existing structures on the site, replacing them with new development to serve as a permanent use. Redevelopment costs and potential uses can vary significantly depending on the size of the site and current property value. Additionally, redevelopment of brownfield sites, especially gas stations, can be extremely

costly due to soil contamination and the need to remediate the soil to acceptable health standards for the intended use.

Redevelopment of brownfield sites is the best option to increase environmental sustainability of the area and secure a long-term use of the site which reduces health and safety risks. Revitalising the land provides the opportunity for various development opportunities, ranging from residential to commercial to mixed-use. This process also reduces any negative visual and physical impacts of the site that may have been influencing the surrounding area. The most optimal approach would benefit the community and cater to their needs. Improving the aesthetic of the site by removing or renovating derelict buildings can revive the nearby area and increase the value of adjacent properties. Permanent redevelopment of brownfield sites can address specific municipal needs and introducing new purposes often stimulates economic development.

Pros	Cons
● More profitable than other fates ● Long term remediation ● Directly address needs of municipality ● Influences value of adjacent properties ● Increase of areas sustainability	● High remediation and (potential mitigation) costs ● High environmental limitations ● Low flexibility ● High liability

Figure 8. Example of Brownfield Redevelopment (City of Dearborn Heights Michigan, 2019)

In Winnipeg, a former gas station was purchased by the financial credit union: Carpathia. As a result of the known contamination on the site, the purchasing cost was acceptable and a redevelopment scheme for a new bank building was proposed on the corner lot site. Redevelopment and cleanup costs totalled $2.9m, including a vapour barrier in the building

foundations and a filtration system to mitigate risk associated with possible remaining contamination on the site (Schlesinger, 2018). Important to consider however, in examples such as this, is the interrelation of strong market characteristics and the prominent location of the former gas station site on a major routeway with high levels of footfall.

4.2 Selection Process

Most municipalities have a long list of former gas station sites with potential contamination and, unless the city is booming, it is unlikely that all sites can be addressed and redeveloped. In this context, evaluating and prioritizing sites for municipal intervention is an important step to achieving the greatest redevelopment impact with limited city resources. Sites where municipal grants and programs will facilitate the greatest impact should be prioritised over those that will benefit few residents and in minor ways.However, it should be noted that even sites low on the priority list can be greatly improved by cheap interventions such as removing broken structures or laying sod.

Choosing which sites to intervene in can be a complicated process and often requires a selection criteria. However, before one can be created, redevelopment goals and objectives should be outlined. Below we have detailed a typical list of objectives and criteria that should be considered:

1. Is the site a stain on the community that many residents interact with. For example, near the downtown core or densely populated areas?
2. Is the market value of the land high enough that municipal intervention can bring a project into profitability for a private partner?
3. Is the site in a municipal improvement area such as a business improvement area or specialized revitalization area?
4. Is the owner of the property enthusiastic about revitalizing the site, or perhaps they simply want the property off their hands?

Existing brownfield research recommend that intervention objectives should be front-loaded in order to categorically establish ‘the implementation of the project, the implementation phases, the challenges faced by the parties involved and the community needs as well’ (Moscovici, 2019, p.5).

A comprehensive assessment of all indicators should be undertaken in order to determine a sites ultimate *development potential.* However, beneath these general parameters, the criteria for evaluating brownfield sites within municipalities become very unique and fluctuate according to a municipalities specific development priorities. Individual indicators inherently assume different levels of importance according to the context in which they exist and municipalities must ensure that, whilst the weightings differ in order to prioritize their municipal

aims, they still loosely operate under the general indicator framework to conduct a fair and comprehensive site selection process.

Limasset et al (2018) suggests that it is important to define the aim toward which indicator tools are being developed (p.1000). For example, considering whether sites in an inventory should be prioritised in terms of urgency for cleanup, a particular preferred reuse option or taking into account a portfolio of sites within a small area. The United States has a long history of screening brownfield sites and have developed a criteria based ranking method. Emphasis is put on a collaborative approach between the local Economic Development specialist and the community as it is shown to help to address regional and local priorities. The repeated message from literature is that multiple groups and stakeholders need to be involved in the early stages of prioritisation indicator design.

Once the pool of sites has been refined, highlighting those which require immediate attention and those which could be left with little impact on the community, it is prudent to investigate the Record of Site Condition for the various choices. If one of these sites has a record, it will give a clearer picture of what type of remediation is required and what type of contaminants are found on site.

Several Tools exist to aid in the prioritization of Brownfield Sites. Broadly speaking there are two methods of prioritizing sites. The first is having a predetermined project and choosing a brownfield site based on where this project fits best. The second is very much the reverse; grading an inventory of sites to determine what type of development would fit in the sites. An example of each will be highlighted for clarification.

Timbre Brownfield Prioritization Tool

Czech Republic, Germany, Poland and Romania, piloted the Timbre Brownfield Prioritization (TBPT) tool, which takes into account three “pillars of sustainability” the economic, social, and environmental factors that affect site selection to aid stakeholder in determining redevelopment potential (Pizzol et al, 2016). The TBPT functions first define input data, followed by normalizing indicators (rescaling input definitions into a common numerical domain), then attributing weights to create a ranking methodology. Attribute inputs are divided into dimensions such as development potential, marketability, environmental risks, success factors such as political actors and agencies, and indicators that quantify and model complex factors (Pizzol et al, 2016). These factors are then divided into two categories; positive factors, increasing site potential, and negative factors, decreasing it. Put simply, attributes are distilled into broader categories and then given a grade of whether they increase a projects chance of success or not.

A Case Study in Moravia, Czechia looked at selecting two sites, one for a shopping mall and one for a solar power plant. The TBPT was used to determine which sites were best suited to each development in the Moravian Viodovoship (Region). The economic, social and environmental factors were described and then assigned ascending or descending

normalization. For example the percentage of people with higher education was considered and given an ascending normalization for the shopping mall, the reasoning being that, higher education and higher salaries for shopping are correlated. However a descending score was given for the solar energy plant, as those with higher education are likely to protest large infrastructure projects more effectively (Pizzol et al, 2016).

The TBPT was found to be useful for prioritizing sites among many options for pre-selected projects. Even in the case of the solar plant, where is was easy to presuppose that agricultural lands would be selected, the TBPT aided in determining which sites among these lands had the highest potential among the 94 agricultural sites in the study (Pizzol et al, 2016). It was also noted that although the information and weighting collected and calculated was aimed specifically at the shopping site and solar projects, the data is a useful starting point for collecting detailed data for other projects.

Some key things to consider are that the Timbre Brownfield Prioritization was implemented on a Regional Scale with two specific projects in mind, and that the weighting system was geared towards these projects. As such, the TBPT method may not be as effective without specific projects pre-determined.

Brownfield Site Ranking Model

In his paper “A Weighted, Multi-Attribute, Site Prioritization and Selection Process for Brownfield Redevelopment” Michael R. Thomas identified 11 sorting criteria for selecting brownfields for potential development. “Such factors include commercial marketing guidelines, financial incentives, environmental regulatory compliance requirements, regional infrastructure and labor resources, and local community acceptance” (Thomas, 2002). In his study, he developed a process alongside the Brownfield Redevelopment Authority of Jackson County in Michigan and tested it on several industrial and commercial sites (Thomas, 2002).

Thomson notes that Brownfields are often neglected by developers due to complications of contamination, permitting, engineering, neighborhood opposition, and liability issues (Thomas, 2002). The lack of information makes choosing brownfield sites risky for potential developers. As such the State of Michigan enacted the *Natural Resources and Environmental Protection Act,* which included steps that reduced liability for brownfield developers. This alongside the *US Environmental Protection Agency (USEPA) Brownfield Pilot Grant Program* helps to level the playing field between brownfields and greenfields in the state of Michigan (Thomas, 2002). The effect was that in the criteria prioritization known contaminated sites were actually given higher scores due to public funding that offset cleanup costs (Thomas, 2002).

Jackson County’s first goal over the course of the study was to create an “objective, repeatable process” (Thomson, 2002), that could be used to attract potential developers to the county’s many brownfield properties. An inventory was to be created that could reduce the number of sites to those that meet the needs of developers while promoting economic

development. A secondary goal was to develop an order of priority for the county's brownfield sites, while the third was to minimize staff time and maximize the efficiency of public funds used (Thomas, 2002). Success was defined as an ability to prioritize sites, maximize the return on investment, minimize the public resources needed, and facilitate cooperation between different jurisdictions.

The procedure was divided into two tiers, the local level and county level. This was to address the reality that sometimes sites are screened for compatibility with a specific project, and sometimes screened to determine a preferred use for a site (Thomas, 2002).

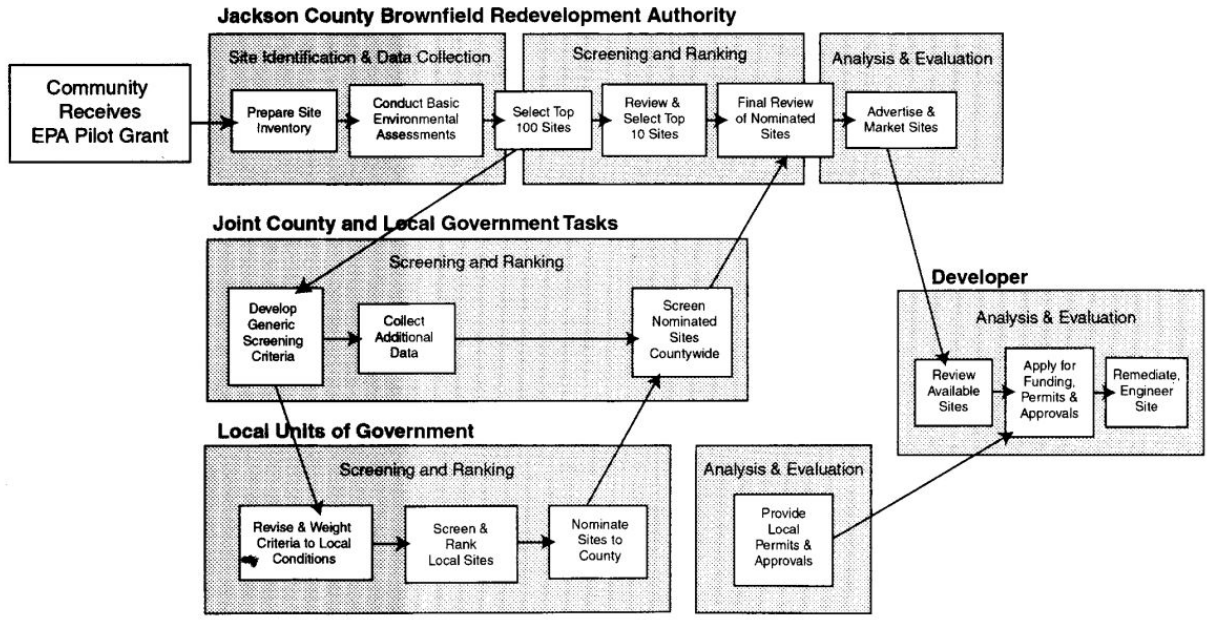


Figure 9. "The decision process used in Jackson County to redevelop a brownfield. The figure illustrates the collaboration between county and local units of government to develop the Brownfield Site Ranking Model, which is jointly developed and applied at both levels of government. In practice, the final siting decision rests with the Brownfield Redevelopment Authority and prospective developer. The local unit of government is responsible for final permits and approvals." (Thomas, 2002).

The local and county Ranking Criterias gave scores to a list of categories based on their importance to redevelopment to a maximum score of 120 points (Thomas, 2002). Below is an example of a ranking for Local Government. The criterias were determined by various sources, such as local planning documents, utility service reports and so forth and were given a standardized score depending on what the site conditions were. For example, being compliant with local zoning gives 100% score to the 25 points available in that category, being compliant with reservations gives 50% or 12.5 points, and being non compliant gives 0 points. These definitions ensure that each potential brownfield site in the inventory is compared in the same way to all the others (Thomas, 2002). Once calculated the total scores of each sites (out of 120 possible points) can be compared.

Table 1. Brownfield site selection, weighting and ranking criteria and information requirements applied at the local (township, village, and city) level

Local Government Ranking Criteria	Max. Point Value	Rank Value %	Avail. Points	Information Source
Site Conditions	30			
Environmental contamination suspected		100	30	Based on local/county-supplied data
Environmental problems unknown		50	15	Based on local/county-supplied data
Environmental investigation partially complete		30	9	Results of Phase 1 ESA/BEA
Physical development constraints exist		15	4.5	MDEQ 201/307/UST database
Environmental investigation complete		5	1.5	Administrative Order Release
Compatibility with Local Land Use Controls (Zoning Ordinances)	25			
Compliant		100	25	Zoning ordinance
Compliant with reservations		50	12.5	Zoning ordinance
Not compliant		0	0	Zoning ordinance
Current Use Compatibility with Local Land Use Plans (Master Plans)	20			
Compliant		100	20	Master plan
Not compliant		0	0	Master plan
Compatibility with Surrounding Land Uses	15			
Compatible, as proposed		100	15	Master plan; zoning ordinance
Compatible, with reservations		50	7.5	Master plan; zoning ordinance
Not compatible, as proposed		0	0	Master plan; zoning ordinance
Utility Infrastructure Capacity	10			
Heavy duty water/sewer, gas, electric		100	10	Utility service specs.
Medium duty		80	8	Utility service specs.
Light duty		50	5	Utility service specs.
Incomplete		10	1	Utility service specs.
Telecommunications Infrastructure	10			
High-tech fiber optics installed		100	10	Utility service specs.
Proposed 1–2 years		80	8	Based on local/county-supplied data
Proposed 2–5 years		50	5	Based on local/county-supplied data
Basic, upgrades in over 5 years		10	1	Based on local/county-supplied data
Transportation Infrastructure	10			
Interstate access/rail/airport		100	10	Local data; type; distance
Class A/primary or state highway		80	8	Local data; type; distance
Secondary or county road		50	5	Type; distance
Local street		10	1	Local data; type; distance
Total Available Points (Local)	120			

ESA = Environmental Site Assessment; BEA = Baseline Environmental Assessment; MDEQ = Michigan Department of Environmental Quality; UST = Underground Storage Tank.

Figure 10. Brownfield Site Selection (Thomas, 2002)

The criterias provide a numbered score out of 120 that can be used to ascertain what type of development is appropriate for each site. The table below shows how this is done. In this case types of use from industrial to open space were considered, but this method could be used for any number of criteria. The final step in the process was to create a geospatial database using Arcview@ GIS showing all the potential brownfield sites and their site information (Thomas, 2002). This allowed sites to be compared by developers based on their development

potential. Over 90 sites were identified and ranked by this process, with 10% having active projects at the time of the article publication (Thomas, 2002).

Table 3. Potential brownfield end uses by land use category and preference range

Proposed Uses	Range of Acceptability	Total Point Value
Industrial	High	120–230
Industrial	Medium	70–119
Industrial	Low	<70
Commercial/Office	High	120–220
Commercial/Office	Medium	90–119
Commercial/Office	Low	<90
Residential	High	90–120
Residential	Medium	60–89
Residential	Low	<60
Agriculture/Open Space	High	70–120
Agriculture/Open Space	Medium	50–69
Agriculture/Open Space	Low	<50

Figure 11. Potential end uses (Thomas, 2002)

This study is particularly pertinent to the city of Cornwall, as Jacksonville County has many of the same characteristics. They are both medium sized cities over an hour away from the nearest metropolis, where growth is limited.

5.0 Cornwall Gas Stations

As mentioned previously, the City of Cornwall has 561 current and former brownfield sites, which is a considerably high number for a small municipality. 145 of those sites are gas stations and 119 gas stations are not decommissioned. Centrally located brownfield sites are tying up valuable real estate that can be used for a more functional purpose, contribute to the municipality's tax revenue, and provide employment opportunities. A high number of vacant sites can create a blight effect that negatively impacts the quality of the public realm so it is a matter of public interest that some intervention is applied to most if not all sites.

5.1 Ranking Selection

The City of Cornwall had selected a shortlist of seven sites within their brownfields inventory based on their local knowledge of the development and community context. This component of the project required this shortlist to be further refined to three sites for the appropriate interventions. In order to determine where and how to intervene, a set of criteria is necessary to compare the development potential of one site to another. The criteria for evaluating brownfield sites are often unique and contextually based on the priorities of the municipality.

The City of Cornwall has emphasized strategic objectives to:

- Support a changing economic base, in particular the growth of the tourism, youth and service sectors
- Accommodate a changing demographics of an aging population
- Attract and retain residents and families
- Enhance community development
- Improve Cornwall's image
- Gain investment retention and attraction
- Further development of small business
- Develop Waterfront
- Expand workforce and skills development

(City of Cornwall, 2016)

While these objectives address distinct areas of development, there are larger strategic actions that can lead to the simultaneous improvement across these areas. Focusing on intensification within the central downtown area and waterfront can help to strengthen the quality of the public realm. A vibrant and diverse downtown area with a multi-modal streetscape design can help to attract a more diverse and young workforce, and also create a more complete pedestrian experience that appeals to tourists and locals alike. The attraction of a younger and more skilled workforce along with the reactivation of viable brownfield sites within highly visible locations can have a positive impact on encouraging greater economic activity.

Based on these strategic objectives, the ideal brownfield site in the Cornwall context is one that is centrally located, and features a use that can provide employment opportunity and contributes to the vibrancy of the public realm.

Beyond the factors that relate specifically to Cornwall's objectives, the characteristics of a brownfield site that have considerable potential of profitability have a low market value. This allows for a significant return on its redevelopment, high degree of visibility, an owner that is motivated to develop the property, and low levels of contamination.

The criteria that was developed with respect to the Cornwall and brownfield specific priorities are:

- **Location:** where the site lies within the municipality can influence whether it is favorable for redevelopment. Strategically located sites, within close proximity of the downtown core and/or areas of existing redevelopment, are more viable and lucrative. They often have better redevelopment potential and pose less redevelopment pressure than geographically removed sites. The Waterfront and central downtown is an area of focus within the city's Official Plan. Locations in the central areas of the city may also be more appropriate for projects with greater intensity.

- **Ownership:** when sites are already owned by the municipality, there is generally more flexibility surrounding the redevelopment opportunities and the process is often less complex. Third party ownership, for instance by a gas company, can complicate the procedure due to conflicting priorities, redevelopment motives and liability concerns.

- **Size:** the size of a site can have a considerable influence on its redevelopment options, however, this particular criteria is very site specific and must be considered in conjunction with all other criteria if the most informed decisions are to be made.

- **Visibility:** sites which are more visible, for instance located on the intersection between two major roads, are more optimal for redevelopment, especially beautification. Poor visibility can compromise a sites redevelopment potential. For beautification and interim use interventions, high visibility will promote greater community engagement with the site

- **Existing buildings:** the presence of existing infrastructure on a site can influence the scope of redevelopment. On one hand, it can affect the financial viability by increasing demolition costs or complicating new building plans. However, it can also offer an interesting opportunity for adaptive, more compact, multi-use redevelopment. The presence of underground service station infrastructure also provides some indication to the risk of contamination.

- **Contamination level:** sites with a potential presence of a hazardous substance, pollutant, or contaminant are less optimal for redevelopment, especially where residential uses are intended. Those that have already undergone environmental clean up are the most favourable.

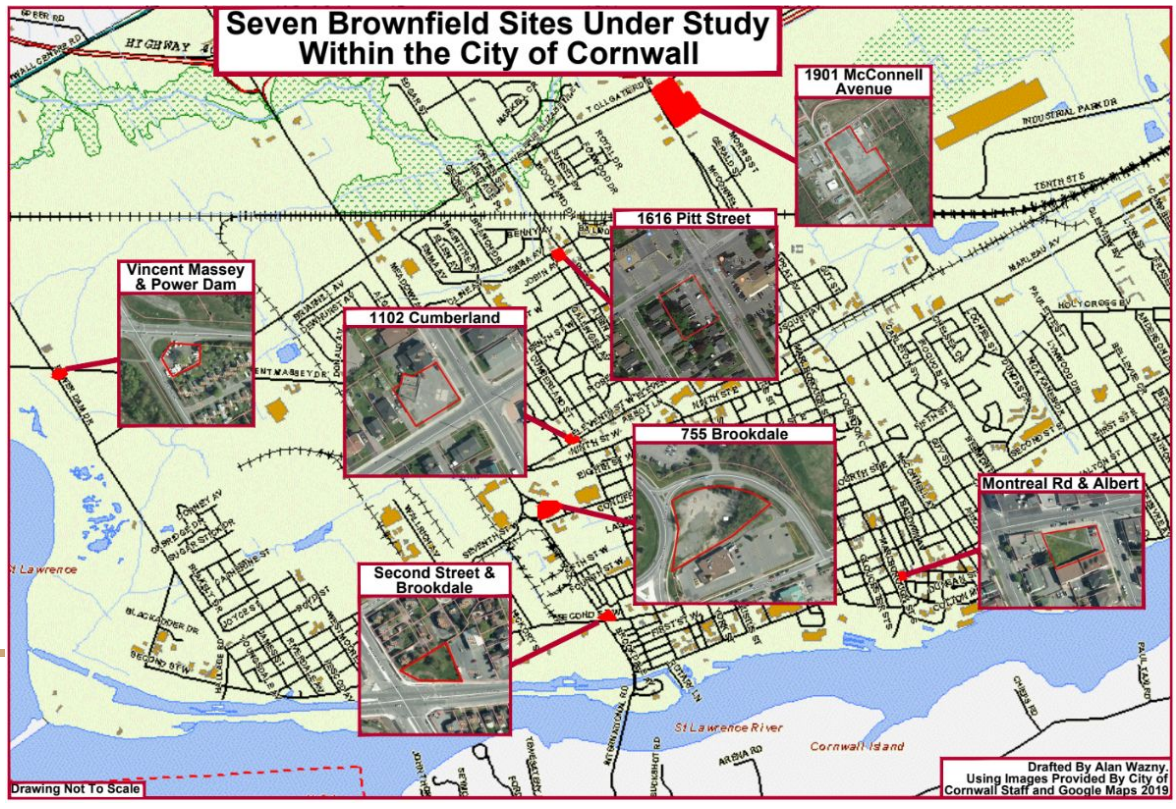
- **Market value:** sites owned by a third party are more attractive when they have a lower price/sqft as it makes purchase and redevelopment more profitable.

- **Zoning:** commercial mixed use zoning is preferable due to better economic opportunities. Maximum permitted height and setbacks can impact the amount of developable space, and in effect the profitability of a project. Parking requirements can also limit the number of units or drastically increase the cost of a development if underground parking is implemented.

The importance of this ranking selection has often been understated in previous efforts to prioritize brownfield sites for redevelopment. Limasset et al's study into key points of interest in brownfield site prioritisation state that no two brownfield site redevelopment plans are identical because the scale and boundaries of a project play a crucial role in the tools applied in a decision making process. Nevertheless, the primary objective of our ranking selection was to prioritise sites in the greatest *need*, "either because they are the most critical or most profitable for a [wider] regeneration operation" (Limasset et al, 2018, p.1001).

Each site was then assessed according to the relevant site characteristics and provided with a general site description in the section below. The map below indicates the location of the seven sites provided by the client.

Figure 12. Seven Brownfield Sites



Albert Street and Montreal Road

Figure 13. (Google Maps, 2019)

The former gas station site at Montreal and Albert Street is currently owned by Imperial Oils and has an estimated market value of $72 250 and $7.89/sq. ft. A 15 minute walk away from Lamoureaux Park, the site is centrally located in Cornwall's Renaissance Community Improvement Area; as such it is located within various special planning areas. It is on a key intersection in the Centretown Streetscape Revitalization Strategy, and located in Le Village Business Improvement Area. This area already has various initiatives to improve street furnishings and enhance commercial activity. The Brownfield is highly visible and although not in a dilapidated state, the lack of activity on the site in what is meant to be a vibrant part of the city (the business district) can be a barrier to greater economic and community development. The Commercial zoning of the site, is an opportunity, in that the business improvement initiatives can aid in the financing of the redevelopment. Due to the central location and location on a major intersection, this site when compared with the others was chosen as most suitable for redevelopment.

1901 McConnell Avenue

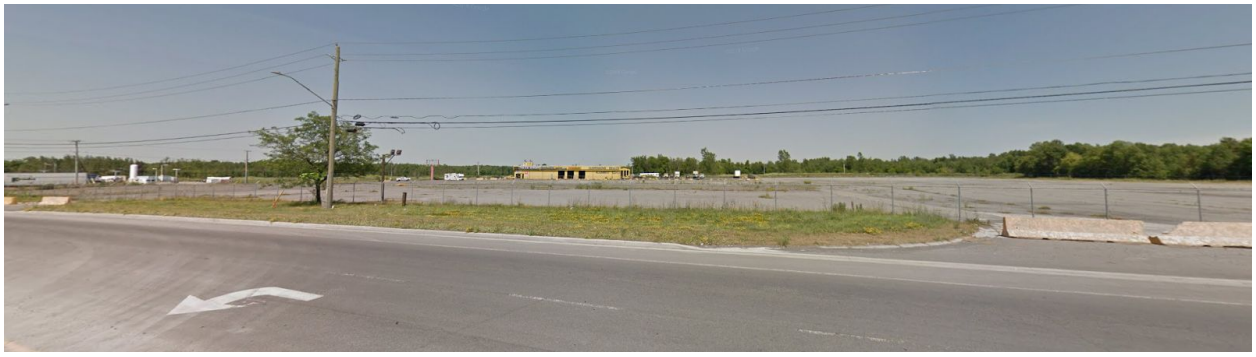


Figure 14. (Google Maps, 2019)

1901 McConnell was formerly a truck stop with a restaurant, motel, and large refueling stations; at 11.74 acres the brownfield site left behind is the largest of those selected by the city for further investigation. The site is far from the city centre, but is strategically placed alongside highway 401 and in the city's Brownfield Community Improvement Area. The surrounding uses aside from a gas station are related to truck maintenance, vehicle repair, and towing. The site is worth $1.824 million but its land value comes in at $3.57/sq. ft, so there is a possibility that remediation would not make the site financially unviable. The team has chosen this site as an interim use, as no redevelopment is forthcoming. The interim use will likely represent a variety of functions given its large size, and reflect the city's rural vision.

Second Street and Brookdale Street

Figure 15. (Google Maps, 2019)

Located at the western edge of the HCIP area the site is currently vacant and beautified, located in the urban residential area of the Official Plan. At 0.33 acres,the site is worth $87,250, at $6.06/sq. ft, and located at a major intersection. The disadvantage of the site is that it is located at the edge of the downtown, and it's awkward narrow shape may lead to traffic flow issues if redeveloped. This site has been chosen for beautification by the project team.

1102 Cumberland

Figure 16. (Google Maps, 2019)

Located North of Ninth Street, the site is not located in the downtown area, and so not located in the Renaissance or Heart of the City Community Improvement Areas. It is however within the Brownfield Community Improvement Area and so eligible for the City of Cornwall Brownfield Rehabilitation Grant Program among others. It is designated for general Commercial use in the Official Plan. Located at an intersection and valued at $109, 000, $11.92/sq. Ft., the property has some potential for redevelopment.

1616 Pitt Street

Figure 17. (Google Maps, 2019)

Located at the Corner of Pitt St. and Emma Avenue, this site is in the north of the city. Designated for General Commercial use the site's neighbours include two restaurants, a Pop Shoppe, a Flooring Shop and an equipment rental location. There are no city initiatives in this area aside from the general Brownfield Community Improvement Plan. There is no publicly available property value for this property therefore it is challenging to assess the financial viability of this site.

Vincent Massey Drive

Figure 18. (Google Maps 2019)

This Brownfield Site is located far from the City Centre, and is currently being used to store RV Mobile home. As this site already has an interim use that reflects the cities rural character, the team has decided to remove it from the selection process. The site is currently priced at $586,000, $5.54/sq.ft

5.2 Site Selection: Qualitative Approach

The weight of these were based on the firm's expertise. They were subjective to our knowledge of the potential relationships and opportunities in Cornwall. Below is a table of what we considered high and low in ranking the sites that were given by the City of Cornwall. Anything that was not considered high or low, was ranked medium (yellow) and described situations of flexibility. Ultimately, it lead us to three sites that we thought had the most potential for beautification, interim use and redevelopment. The lowest score was set for beautification, the median was ideal for interim use, and the highest score suggested for redevelopment. Instead of picking the top three rankings for the three fates, we did this to emphasize that all sites deserve attention. The other sites also have potential, but in within our proposal, we have nominated them as leave-as-is for further research to be done. The full site selection table, for all seven sites, is locate in Appendix-B.

Priority	High	Low
Ownership	City of Cornwall owned because of known cooperation	Privately owned due to major focus on profit returns, or unknown cooperation
Market Value	Inexpensive square footage; ~$5.00 and under	Expensive square footage; $10.00 and over; or undisclosed
Visibility	On 2 major roadways and situated on a corner lot	On minor roads within a residential area
Presence of Structure/Infrastructure	Vacant lot	Pre-existing structures with use

Zoning	Commercial or Mixed-Use	More restrictive, such as highway commercial, retail and height limits
Location within Municipality	Central	Removed significantly

Site Selection Criteria							
Site	**Ownership**	**Market Value**	**Visibility** (greater visibility from main roads)	**Presence of structures/ infrastructure** (vacant site with no infrastructure is ideal)	**Compatibility of zoning** (commercial or mixed use zoning is preferable)	**Location in municipality** (relative to central core and/or areas of redevelopment)	**Total Score**
Albert & Montreal St	Imperial Oil MED	$72 250 $7.89/sq. ft	Corner on two major roads Downtown	Partially used as a parking lot	Commercial	Central	**16**
2nd & Brookdale	City of Cornwall HIGH	$87 250 $6.06/sq. ft	Corner on two major roads Off US bridge Provincial Highway!!!	Easement for a combined sewage line going through property	Vacant Commercial	Semi-removed	**11**
1102 Cumberland	Paul Michael (2017) MED	$109 000 $11.92/sq. ft	Corner, 2 major streets	Large structure suitable for commercial use	Retail 1 story Under 10000 sqft	In residential	**12**
1616 Pitt Street	Petro Canada/ Suncor	Not given	Corner lot on Pitt/Emma street	Large structure suitable for commercial use	commercial Auto dealership - independent	In residential	**11**

					dealer or used vehicles		
1901 McConnell Ave	Fifth Wheel Corporation - Jim Warren	$1.824M $3.57/sq. ft	Off 401 - 2 major streets	Vacant lot	Commercial	Removed	**14**
Vincent Massey Drive	Wesley Murray	$89 250 $5.54/sq. ft	Corner lot - only 1 major road	RVs on site	HWY commercial	Removed	**12**
755 Brookdale Ave - SOLD	Suncor Energy	$586 000 $9.47/sq. ft	Roundabout - 3 major roads	Testing wells on site	HWY commercial	Semi-removed	**13**

5.3 Site Evaluation: Quantitative Approach

The feasibility of a site is vital in its evaluation. Though the site selected may have great potential, developers will not be incentivized to take on the large risk if their redevelopment does not result in an attractive return on investment (ROI). This is particularly relevant for gas station brownfields as the cost of remediation will not be sufficiently covered by the if the property value does not create a large enough tax income to match. Therefore, a quantitative approach to site selection is needed to determine the value of the opportunity - creating a more accurate site prioritization.

There are several factors that various stakeholder are concerned with in this approach. The assumptions are a significant aspect of this - namely, the vague cost of remediation. In the different scenarios that our team has researched, the one common element that surfaces is that breaking ground has frequently posed a large liability to the success of the developments. The cost may be more than what the CIP will cover. For example, with Carpathia Credit Union, actual remediation cost ($2.9M) turned out to be significantly higher than the estimated remediation cost on a 3200 square foot lot in the City of Winnipeg (Schlesinger, 2018). Unfortaintely, there is no standardized way to determine remediation costs**.** In addition to this issue, insufficient city services needs to be taken into consideration as well - as more money will be needed to meet the standards of the redevelopment if it is not local and available.

In places like Toronto, the property value can skyrocket when paired with the market demand - covering the heavy costs of remediation. In less popular cities, this can be a far reach, as it will have to be in a valuable location and open to intensification to attract developers. Therefore, with the inherent size of gas station brownfields, more creativity may be needed to recoup the cost of remediation - which, in turn, can tap into an underserved, or niche, market. For example, changing gas stations into electric charging stations (Peters, 2018)**.** Furthermore, matching the project to the market demand is just as important. If there is no demand, the ROI may not be existent. Again, this is another risk that the stakeholder would have to take on.

Most importantly, access to a construction loan and a manageable amortization schedule is essential. Though the stakeholder agrees to take on the risk factors, and believes that they can create a desired ROI, if the cost of the project is out of scope, investors may be too hesitant to support the development. Additionally, more equity may be requested by the investors. If an investor does give a loan, to cover a large cost, the amortization schedule will most likely be longer, resulting in a longer return period. This may not be attractive for developers as they may prefer to move on from the project as quickly as possible. As time is money, contaminated sites may require much more attention and time. With bad documentation on the site, the process of record of site condition may not be smooth, and the interest on the loan will accumulate more than expected. Therefore, access to investments is key to revitalizing brownfield gas stations.

Value is the ultimate factor in determining the right site for selection with all the moving parts. This means that more tools by the federal and municipal governments are needed to help revitalize brownfield gas stations in places where property values are low. Help at more stages, not only at the remediation stage, may be needed. For example, though taking on the cost of the land is only a small faction of the cost, it is still a valuable relief. With this in mind, Alexander (2012) suggests that ‘effective municipality-led brownfield redevelopment PPPs ideally function as highly central networks’ with information exchanged readily across multiple project partners to achieve end-goals (p.757). Additionally, conditions to any CIP should also benefit the remediator, and not just the taxpayer. Therefore, opportunity for partnership is to alleviate risk can also be a strategy that can make costs less daunting.

6.0 Cornwall Reuse Options

The three sites fit for beautification, interim and redevelopment, discussed in this section, are based on Cornwall's overall objectives and goals. The variables were weighted based on the municipality's hierarchy of values. In this way municipalities can take a standard set of variables and make them fit the local context of redevelopment priority (Thomas, 2002). In this city, factors such as high visibility, city ownership and low market value were prioritized. Three sites ranging in scoring were then brought to our attention - lowest scoring, medium scoring and highest scoring. In the firm's expertise, lowest scoring is seen best fit for beautification, medium scoring is best fit for interim, and highest scoring is best fit for redevelopment. The three highest scores did not determine it's fit for a fate for action because we believe that all sites deserve attention - this being that each site is unique. Variables, and opportunities, are difficult to forecast and account for to be cross examine against. Additionally, this is a method to improve interest in all sites, and not just focus on sites that appear to be easiest to take action upon.

Second and Brookdale was chosen as a site for beautification by our consulting firm because of two primary reasons: it's high visibility and its city ownership. With a lot size of 0.33 acres, it lies within very close proximity to the bridge connecting New York state and Cornwall, and on the intersection of two major highways, suggesting high volumes of vehicular traffic constantly pass the site - making site aesthetics particularly important. The site also borders with residential units and boasts good pedestrian permeability, further increasing its remediation potential. Restricted parking and vehicular access as well as the existing sewage line running across the site somewhat compromises our remediation options, hence the plans for beautification only. Furthermore, it's ownership provides a perfect opportunity for the city to make the site a landmark and welcome it's visitors, as well as encourage residents to be prideful of Cornwall.

On the other hand, currently under private ownership by Fifth Wheel Corporation, 1901 McConnell is located just off of highway 401, bordering two major streets, McConnell Avenue and Tollgate Road East. The size of this site, as well as its surrounding context were the prominent features in determining its suitability for interim use. Being 11.74 acres in size presents an opportunity for temporary usage that can develop into a permanent redevelopment. As a commercial land surrounded by green space, and is close to a body of water, our consulting firm believes that proximity to these attractive attributes calls for a community-based redevelopment. Additionally, with the future residential neighborhood located adjacent to the site, the team sees it as an opportunity to leverage community interest into community movement.

Situated in Le Village, the Albert and Montreal site's main strength is its central downtown location, near the waterfront. The surrounding units are primarily commercial, mainly owned by Dubuc Eye Care Centre, and the site itself is owned by Imperial Oil. Its current partial

use as a parking lot for Bergeron Electric and previous lease discussions reflect the sites redevelopment potential. Moreover, this area experiences the highest percentage of pedestrian traffic within the City of Cornwall making it an excellent location for long-term redevelopment, as well as providing an opportunity to encourage active transportation instead of car ownership. Focusing on retail-at-grade, and parking-at-rear to maintain the street fabric will also be an option to minimize the clean up costs and avoid dig-and-dump interventions.

The special policies for the reuse recommendations are listed in Appendix-C.

6.1 Beautification: Second & Brookdale

6.1.1 Primary Option: Signage

To help Cornwall gain a large sense of identity, this site would be a fit for signage. Being situated by the border, and constricted by its current lot size and vehicular accessibility this site is well suited for beautification. It would introduce and welcome visitors to Cornwall, and present a positive first impression.

With the standard City of Cornwall sign, the team has discussed multiple ways in which the surrounding landscape can complement and enhance its curb appeal. The first option was creating a meadow encircling the sign and covering the entirety of the site. A meadow is a viable, sustainable and relatively inexpensive option for a beautification project of a former gas station brownfield. There are many benefits derived from the investment of a meadow at this particular site, such as promoting walkability by incorporating a natural pathway, mental and physical health benefits, increasing wildlife biodiversity, along with countless environmental benefits (Toronto and Region Conservation Authority, 2019). From the consultation that Mr. Alain D'Aoust from the City of Cornwall provided, the goal of placing a meadow is to utilize natural ways, such as replanting (i.e. grasses, white clover, willows, and more), to create a welcoming and walkable green space that can act as a connecting point to the surrounding green space as well naturally remediate the contamination with planting specific plant species and encouraging native species and other biodiversity.

Figure 19. Street view of new City of Cornwall sign and conservation meadow (Made by Irene Patrinos)

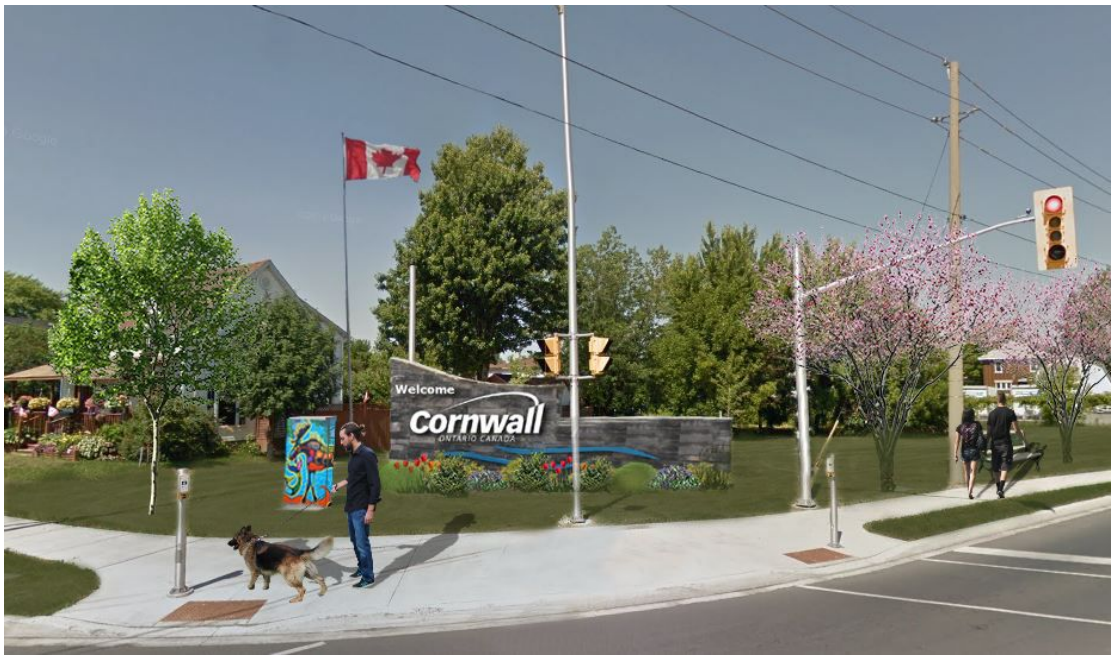


Figure 20. Street view of new City of Cornwall sign and manicured landscaping (Made by Irene Patrinos)

6.1.2 Alternative Options/Additions: Parkette with seating area

The second option is incorporating landscaping to the site in order to attract the community to interact with nature and in turn with the site. Landscaping not only enhances the look of the site but also creates a gateway feature for the City of Cornwall. The team discussed the addition of benches for seating, planting more trees both on the site and along the street, and encouraging public art. As a landmark of Cornwall, it would be a potential place of gathering that could be used with recreational programs - working towards the 2020 goals of the Master Recreation Plan (2009). For example, it could be where youth running clubs and senior walking clubs meet. Street trees are a vital contributor in reducing stormwater runoff and the urban heat island effect as well as enhancing biodiversity and improving air quality (Mullaney, J., Lucke, T., & Trueman, S., 2014). Public art with encourage community engagement and a sense of Cornwall identity which is especially important for this site because of its proximity to the United States border.

6.2 Interim Use: 1901 McConnell

The large size of this site presents a unique opportunity to implement one or more interim uses that can promote more community activity and an improved public realm to enhance the perceived development potential of the site. The ideal interim use will encompass uses that can fulfill a public benefit by generating revenue, encouraging economic activity, providing community space, offer opportunities for social interaction, promote food security, or promote a more vibrant public realm.

6.2.1 Primary Option: Event Space & Innovation Centre

One option that was explored by the firm was an event space that can accommodate town fairs, events, markets and community gardens by providing open space, seating, and containers that are adaptively reused for vendor/retail space. Provided the size of the site, there can be multiple uses that can be integrated into the space to promote greater levels of activity regardless of the seasonality. As shown in the aerial plan below, the firm has separated the site into four spaces, parking, pop-up market space, farmers market and community garden. Due to the size of the lot and the multiple uses the firm expects a high volume of citizens will be drawn to the site therefore parking must be accomodated.

Figure 20. Possible locations of the pop space (Made by: Eric Gao)

Figure 19. Street View of the vibrant event space (Made by Eric Gao).

The pop-up market place shown above is equipped with shipping container retail space that can be rented but entrepreneurs, business owners, and community folk. The space will also

incorporate seating, open space and a pop-up movie theatre that can be enjoyed by citizens on the weekend and for events. Since the site is zoned highway commercial and is situated in a historical trucking area, the firm believes that incorporating shipping containers is a way of recognizes its cultural heritage and uniqueness. The farmers market area is a flexible market space that can host farmers markets on the weekends, town fairs during the summer months, christmas markets during the winter months and in conjunction with the pop-up market can hold large scale festivals and events. The community garden space is an opportunity for residents of the area to grow their own locally sourced food and potentially sell their produce at the farmers market. Since the growing season is relatively short in Cornwall the firm believes incorporating shipping container farms would provide the opportunity to farm all year round. Eric Bergeron, a Cornwall native, is co-founder of Smart Greens, a company that started freight farms housed inside a shipping container that holds 3,600 plants in approximately 300 square meters of space. Eric Bergeron stated,"we envision hundreds of these in Canada. There's no reason why we couldn't have 10 of them stacked together here in Cornwall, or in Ottawa, or in larger markets" (CBC, 2014). This poses an opportunity for partnership in terms of feasibility, expertise and promoting local businesses.

Figure 20. Street view of the farmers market and community garden space (Made by Irene Patrinos)

The farmers market in this development proposal was modelled after the Greensgrow Farms in Philadelphia, which is situated on a former metal-galvanizing plant. The farm produces 2,000 pounds of 20 different vegetables, serves 10,000 customers annually and employs 45 paid staff through relationships with local farmers. Greensgrow prides itself on local urban farming which is solely grown above ground in either raised gardens, hoop houses and fabric bags (Sheridan, M., n.d.). 1901 McConnell Avenue has the potential to achieve this level of success if given this development opportunity.

6.2.2 Alternative Option: Sports field

With the inherent size of the site, a sports field was an idea the firm was excited about. It would be a relatively cheap and safe interim use, as not much would be needed. Only thick turf, some accessories for the field (ie. goal structures) and grass paint would be prioritized for the standard look of a sport field; and with success in the summer, the winter can provide for a dome. However, due to the plans to locate a new field near the Benson Centre, this secondary field would be redundant. The new Benson Centre field would be prioritized over this proposal as they would be sharing amenities to offset operational costs. However, we suggest that for any other municipality, lots of this size can accommodate sport fields for recreation programs, improve community involvement and increase physical activity of the residents in the neighbourhood. It is an effective interim use as it brings attention towards the site by transforming the blight into a community space. This can act as a marketing plan, and encourage developers to help make a larger change for the supportive community.

6.2.3 Alternative Option: Solar Farm

In this age of conscious consumption, a solar panel farm was an attractive idea that came forward. However, due to the pre-existing low electrical rates that the City of Cornwall offers, and the solar fields and windmills in the adjacent areas, there is no demand for this. In areas where there is larger demand of energy, or for more conscious energy sources, gas station brownfields of this size could become a potential revenue source. Not only does this propose forward thinking, and align with the many environmentally conscious goals of different regions, but it also helps support low income families. It is an investment that can help future generations increase their resiliency and push them to change their behaviours into an environmentally net positive lifestyle.

6.3 Redevelopment: Montreal Road & Albert Street

6.3.1 Primary Option: Mixed Use Development

Figure 21. Mixed use render of retirement residence (Made by Eric Gao)

Figure 22. Mixed use render of residential-commercial building (Made by Irene Patrinos)

Mixed-use development is particularly popular and advantageous in a variety of aspects. For Cornwall specifically, the opportunity to synergise different land-uses through mixed-use infrastructure, such as residential and commercial, is attractive for channelling economic enterprise, harnessing youth innovation and promoting social inclusivity. The Albert and Montreal site is especially appropriate for long-term redevelopment, being situated in central downtown and surrounded by commercial units. An example of a mixed-use brownfield regeneration project is Egleston Crossing in Roxbury, Massachusetts. The development comprises two new buildings, with 64 units of affordable housing above retail shops, which now acts as an anchor for the neighbourhood and, according to Mayor Menino, has brought new life to the area and inspired further revitalization (Lehman, 2005). This is a positive precedent for long-term brownfield redevelopment, which would also help to push forward Cornwall's 20 year downtown vision: an "animated [and] pedestrian friendly" downtown (City of Cornwall, 2018).

The City of Cornwall is not new to brownfield redevelopment. The Cotton Mill Lofts situated in Cornwall along the St. Lawrence River was a successful and profitable brownfield redevelopment project. The development reactivated a once industrial factory into a lively mixed-use community. Another notable brownfield project is the student residence at the St. Lawrence College. This development has not yet begun, but it will house 168 students and accommodate commercial space on the ground level (Cornwall Free News, 2018). A few small-scale projects include the transformation of Hope's Garage on the corner of Pitt and 11th Street West into a chiropractic office in 2017 and the renovation of 1170 Pitt Street laundromat into a finance company and computer store (Cornwall Community Museum, 2018).

Pro Forma for Mixed Use Options

The site on Albert and Montreal Street has been identified as ideal for redevelopment. The first option proposed is a mixed-use building with commercial space on the ground floor and residential units above. For this option we have attempted three different scenarios: mixed-use condos with residential above commercial and underground parking, mixed-use condos with residential above commercial and surface parking and mixed use condos with residential above commercial with half the required surface parking. The fixed assumptions that have been made in these scenarios are a land cost of $7.89 per square foot, soft costs of 36%, a contingency fund of 5%, a brownfield clean up fee of 7.50% and a building efficiency of 85%. The cost of the land and the site size was provided by the City of Cornwall. The brownfield clean-up fund of 7.5% is a fund to be set aside for any potential environmental and contamination fees that may arise from the former gas station use of the land. This entire fund could be used or only a small portion of it as the exact cost of contamination is difficult to estimate, this fund would be a fair share of the building costs. The construction costs have been calculated from the current Altus cost guide of a wood framed condo construction from Montreal, as it is located in near proximity to the site (Altus Group, 2019).

The first mixed use scenario with underground parking is not a profitable option as there is a negative profit of $1,481,197.49. This is due to the costs being greater than the revenue generated and this would be the case even if this were not a brownfield site. The second scenario includes commercial space on the ground floor with residential condominium units above with surface parking. This option is still unprofitable, however with the reduction of underground parking, this scenario becomes more feasible. The third scenario has half the surface parking and becomes more profitable but it is still not feasible for a developer to develop this site. With brownfield tools added to the third scenario, the profit is -$295,949.78 but this is still a poor return. If the brownfield clean-up fund were reimbursed, then the profit would be $180,989.99, which is still not enough to attract a developer to the site.

The second option is a retirement residence; this scenario assumes amenity/lobby space on the ground floor with surface parking. This scenario has an FSI of 9.0 with a building footprint of 5,795 square feet (after removing all setbacks) and it has expensive rents that could be gained through a retirement residence. Based on CMHCs report of seniors rental housing, a seniors rental in Ottawa or Kingston, Ontario would charge approximately $3,200.00 on average a month for a bachelor or private room with meals included in rent (CMHC, 2018). As this data was collected in 2016, these rates could be presently higher and depending on the quality of services/living areas the rates could increase. This scenario presents a 20% profit to cost ratio over the 10 years of operation, which is a 2% return over the 10 years, a very small but positive return on this investment. Adding additional brownfield tools to help decrease the loss of capital in brownfield remediation or long term tax breaks could help make projects like this profitable and have a healthy return to make developers excited about working with brownfield sites.

What could attract developers to this site would be an accurate record of site condition to help estimate the exact costs of remediation. This could be aided through reimbursement or tax credits from the municipality or provincially. Another way that development could be attracted to this site would be through property tax reduction after the development is completed. For this example, by reducing the tax rate by 0.5% (to 1.0%), it increases the profit to cost ratio by 10% over 10 years. This could help promote the long term investment and reuse of brownfield properties with a tax reduction. This could help reduce the amount of vacant brownfield properties in Cornwall.

The full proforma is listed in Appendix-D.

6.3.2 Alternative Option: Cafe/Restaurant

The location of the Albert and Montreal site makes it an ideal location for commercial land-use in the form of a restaurant or cafe. Boasting the highest percentage of pedestrian

traffic in the city, this use seems like a logical option for redevelopment, especially one that will help to stimulate the downtown economy by acting as a space for social interaction and incentivising further commercial development along Montreal Road. The Tim Hortons, located approximately 500 metres east of the site, has been incredibly successful and serves as a useful example for the commercial potential we envisage this site to have.

This was second to the mixed use redevelopment (above) because it appeared to fulfill the objectives of the Cornwall Official Plan more. Technically, the mixed use proposal is an extension of this option. From offering a residential use as well, the mixed use redevelopment offers a more creative take on Cornwall's urban form.

6.3.3 Alternative Option: Parking Lot & Public Art

A fallback option for a former gas station interim use could be a parking lot. Located next to multiple restaurants, services and businesses, the parking lot would be useful for the pervasive car culture in Cornwall. In areas focused on walkability and public transportation, we do not recommend this option.

For this option, asphalt capping the surface would the most cost efficient. Additionally, it could be a revenue generating use for the owner of the site, as the spaces could be rented out to local businesses and owners for their customers. To make the site more vibrant, adding small public spaces like seating areas next to the commercial and retail stores, or adding greenery around the site and parking could be done. As nothing major would need to be demolished or redone to the site to accommodate new structures, this option provides a simple method until future redevelopment costs could be justified.

However, this may not be possible on this specific location because of rumored previous land use dispute. While Bergeon Electric had initiated interest in the property and offered to pay for the asphalt cap, the current owners placed a condition of an increased lease rate onto the agreement. Bergeon did not agree to the condition, as they would have prefered to be the owner if that situation. As gas companies do not like being shamed, public push will be needed to enforce change for this option.

7.0 Conclusion

Research and findings have lead the team to conclude that the remediation and revitalization of a brownfield site has the potential of achieving innovative, forward-thinking, and sustainable goals. Drawing from our guiding principles, site criteria, literature review and client feedback, Catalyst Consulting has prepared the tools and steps necessary in order to move forward with brownfield redevelopment in Cornwall, as well as similar cities across North America.

7.1 Next Steps

Following the details from the proposal above, we transition into considerations for what the future entails for brownfield redevelopments. The government of Ontario heavily encourages municipalities to develop and remediate brownfield sites through Community Improvement Plans (CIP), grants, financial incentives, and best practices analysis. Each municipal tier plays an irreplaceable role in the rehabilitation of these lands, as they are the largest partners and contributors to the success of a brownfield site. In fact, reaching out and creating relationships amongst other municipalities and developers, and combining private and public funding can ensure a higher success rate.

Catalyst Consultants recommends that more drastic measures should be taken by municipalities, and powerful stakeholders, to incentivize redeveloping brownfields, in order to equip towns with less resources to foster growth - population-wise and financially. We propose that municipalities throughout Ontario and North America include more options for future brownfield development including:

- Amend aspects of the Municipal Act that enable municipalities to levy taxation on abandoned properties at rates high enough to encourage remediation and build the resources for effective tax-increment funding programs;
- Require landowners to provide multiple visual aids and land layouts (i.e. blueprint) during phase 1 of the project;
- Amend aspects of the Environmental Protection Act that extend the circumstances under which a record of site condition is required in respect of a contaminated site;
- Present multiple viable proformas to ensure more financial security;
- Reaching out to other municipalities and developers, for example at the annual Brownfield Conference, to build relationships and community engagement.

There are many advancements, and much awareness, around brownfield development, and the benefits and potential capabilities that a community could gain. However, there is still aspects of brownfield redevelopment which require a closer look. For instance, an increase of

financial research, by removing uncertainty and unknown potential costs, would be the main attraction for developers. Lastly, we have found that educating all parties in the evolution of the 'urban image' would demonstrate the success of brownfield revitalization. In turn, this would attract more attention, funding, and redevelopment.

7.2. Recommendations

Cornwall and other cities in its situation may consider adding specific policies to their planning framework in hopes of reducing brownfield idleness. Our recommendations would be to add more lucrative financial incentives for landowners redeveloping brownfield sites, and/or adding vacant land taxes for landowners abandoning brownfield sites. Below are our two recommendations for these processes:

7.2.1 Tax Reductions for Redevelopers

One option to motivate developers and landowners to redevelop their brownfield sites would be to reduce taxes on the development of the newly clean sites. This would relieve some of the financial burden from developers - who are able to afford redevelopment, but are not motivated to do so, and are motivated to wait till the value of the site is increased over time.

The option has the potential to be popular and acceptable, as it would be a financial incentive coming from the supportive city. In past studies, incentives have shown positive results in hastening redevelopment (Adams et al., 2000). When taxed, some property owners were actually delayed from developing. The financial incentives in the case study showed zero delays, and 29% of responses from owners slightly hastening of projects and 23% significantly hastening them**.** Many corporations would see advantage in using the rebate to increase profits while revitalizing land to further improve the community it is within. Additionally, it would pressure other brownfield owners to take responsibility of their presence in the community.

The implementation of this program should also be limited temporarily, as to give a sense of limitedness to the tax cuts and potentially making redevelopment a greater priority for developers. While the tax reduction rate would depend on the city's budget, a minor tax cut such as 5% cut would potentially start up redevelopment.

While a policy like this one exists in Cornwall (Brownfield Property Tax Cancellation Assistance Program), many other cities do not have such programs, and would likely benefit from them. Furthermore, such programs could be implemented at the provincial level. Programs at that scale could not only offer help to municipalities without funding to lower taxes on properties, but also help cities with existing programs remove more cut more taxes to incentivize development.

7.2.2 Vacant Land Taxes

On the flip side of the incentive, we would also propose additional taxing on unused brownfield properties as a method of putting pressure onto owners to redevelop, or sell land to interested developers. Increasing the taxes on such properties would further burden owners with financial issues from the property, and may be able to make a difference in behaviour.

This option, as opposed to the tax reduction, would be seen as an attack on oil giants, and would quite possibly make a difference. Price differences may not be massive, but it should be a push on oil companies and landowners to make the decision to sell or redevelop the land themselves.

Examples of the effects of such a policy are seen, again, in the Adams et al. 2000 study looking at property owner behaviour responses to taxes and incentives. In this study, a 5% tax on vacant land had mixed results: 19% of the developments would be delayed, 16% would be hastened, while 45% of owners would not do anything and 11% did not know how to respond. At a 25% vacant land tax, however, the behaviours slightly changed. While the number of delays went up to 21%, the number of hasted projects went up to 32%, with the no-impact responses going down to 32% and no responses up slightly to 12%.

The example shows that if the goal is to increase response in developers, the likely best method within taxation would be to set a strong enough rate, such as the example's 25%, to make property owners redevelop or sell land. From there, money collected from the tax could go forward to the previously mentioned tax cut for developers. Other methods to implement these additional taxes would be to go in increments, such as 10% increments per year for 5 years.

The one issue with this taxation method is that it may disproportionately affect individual landowners in contrast to companies. While larger corporations could effectively still have time to make decisions on what to do with land while a 25% vacancy tax was in place, a singular landowner with limited financial resources may not have such a luxury, and would likely suffer more from such a move.

7.3 Closing Statement

Many municipalities across Ontario are facing the same battle on how to target and reactive a brownfield site, Cornwall is simply one example. Brownfield sites retain enormous potential for helping the future of Ontario to accomplish pivotal goals, such as building healthy communities, bringing land back to productive use, protecting valuable resources through intensification, and optimizing existing infrastructure (Brownfields CIP, 2010). While the remediation and redevelopment of an abandoned or contaminated site has its challenges, our team has invested the time to take advantage of the opportunity that such sites present. A

common theme which was discovered throughout the research process was the importance and need of having strong management to be able to educate stakeholders and investors to reignite their interest about brownfields and the multiple benefits to the local community and surrounding neighbourhoods. It is always the goal and expectation when making an investment into a project, such as a brownfield redevelopment, for it to be successful and profitable. However, there is a common stigma around brownfields, and the assumption is that more money will have to be invested than the benefit from the project in order for there to be success, this is false. It has been seen through regional, national and international examples, that the revitalization of a blight, vacant, contaminated site, with the visibility and location access that brownfields have, to not only be successful and profitable, but has allowed individuals and communities to innovatively and creatively improve the economy, community and environment.

The province of Ontario along with local municipal governments try to aid the development of brownfield sites by providing financial incentives, economic development, marketing program and brownfield inventories - all of which allows for a crucial toolkit in the early stages of a brownfield revitalization process. With government incentives and community improvement policies, brownfield sites should not be shunned away for greenfield land. We instead encourage future stakeholders and investors to grasp at the opportunity to create more vibrant and forward thinking communities.

8.0 Appendix

Appendix-A: Official Plan Brownfield Policies:
2.4.9 Similarly, most of the future residential growth of the City over the planning period is expected to be in the form of Greenfield development but with increased emphasis upon rehabilitation of older homes and infilling projects and Brownfield site redevelopment.
3.3.4(f) redevelopment of declining or underutilized older Industrial areas and Brownfield sites to mixed compatible land use, appropriate to surrounding neighbourhoods, subject to applicable Environmental Legislation (i.e. such as Records of Site Condition (RSC)).
4.4.2. 1. Concentrate retail stores, offices and other services into identifiable and well planned commercial centers appropriate to the trade area population.
4.4.2.3 Concentrate businesses in geographic nodes and direct commercial development along arterial roads, to such nodes.
4.4.2. 4. Promote orderly development through the control of access points and through the encouragement of clustered development.
4.4.2.7. Reinforce and promote the Business Districts including the Downtown Business District, as major commercial, office, administrative, cultural, tourist, service centers and higher density residential in the City and continue to encourage the Business Districts to develop as places for pedestrian interaction.
4.4.3.2. Wherever feasible, promote the redevelopment of existing viable commercial areas prior to the approval of new commercial areas.
4.4.3.7. Encourage the appropriate re-use of abandoned service station sites.
4.5.1 Business District Definition Those lands designated Business District shall be developed as the City of Cornwall's main business and activity areas providing a high density concentration of retail, service and office commercial activities, Government facilities, public and private institutions, recreation and entertainment uses, social, cultural, tourist facilities, hotels and housing.
4.5.2.2. Direct the majority of future office space, both public and private to locate in the Downtown and Le Village Business Districts. New office development shall generally be discouraged outside of Business Districts

4.5.2.2. Direct the majority of future office space, both public and private to locate in the Downtown and Le Village Business Districts. New office development shall generally be discouraged outside of Business Districts

11.6 Former Solid Waste Disposal Sites, Contaminated Sites/Brownfields

14.23 Community Improvement Policy Areas: Phase I Environmental Site Assessments (ESA) should be carried out at sites which may be contaminated and Phase II ESAs should be completed if required. These studies should be undertaken prior to the issuing of applicable planning approvals. It is intended that this Section will provide the necessary focus for community improvement decisions, programs, and projects over the course of the planning period of the Official Plan.

14.2 Area 16: Brownfield's Strategy Area

a) Definition of Brownfield land:

"Brownfields are abandoned, vacant, derelict or underutilized commercial and industrial properties, usually provided with urban services, where past actions have resulted in actual or perceived contamination."

The Brownfields Statute Law Amendment Act is a consolidating statute which assembles a series of amendments under seven existing statutes with the specific aim of reducing liability associated with existing contaminated sites, providing certainty to the process of documenting contamination, identifying conditions of use, and improving the potential for the remediation of contaminated sites.

Brownfield Strategy Community Improvement Policy Area

a) Definition: The Brownfield Strategy Community Improvement Policy Area encompasses most of the City's "urban" land, with the exception of a number of stable residential neighbourhoods and future development areas within the City's new Industrial Park (north of Tenth Street). It also captures portions of the industrial and commercial lands located at the eastern and western ends of the City, as well as other pockets of industrial and commercial uses interspersed throughout the City. The Brownfields Strategy Community Improvement Policy Area is shown on Schedule 6.
b) Criteria for Establishing Brownfields Strategy Community Improvement
   The following criteria have been used to define the Brownfields Community Improvement Policy Area:
   i) Inclusion of areas within the "Urban Area", as defined in the Official Plan
   ii) Inclusion of areas within the limit of municipal servicing;
   iii) Inclusion of the inventory of known derelict and/or potentially redevelopment and re-use in these Community Improvement Policy Areas are consistent with the goals of the Brownfields Strategy Community Improvement Plan;
   iv) Inclusion of the Downtown Business District and Waterfront area, and specifically the inclusion of potentially contaminated lands, and underused/vacant properties with redevelopment potential;

v) Inclusion of current and former industrial and commercial sites within the "Urban Areas" potentially suitable for redevelopment or re-use including:
   1) Potentially contaminated lands;
   2) Vacant and underutilized lands or abandoned buildings; and
   3) Former railway corridors.

vi) The Brownfields Strategy Community Improvement Policy Area
   1) Stable residential neighbourhoods;
   2) Generally, sites without external municipal services; and
   3) Future development areas within the City's new industrial park

c) Application: Within the Community Improvement Policy Area, support will be given to the redevelopment of Brownfield lands in conformity with the objectives of the Official Plan. The City may, within the Policy Area, provide assistance to redevelopment efforts through the creation of various programs and policies as may be deemed appropriate and in accordance with the eligible costs outlined in Section 28 (7.1) of the Planning Act.

Appendix-B: Site Selection Criteria

Site	**Ownership**	**Market Value**	**Visibility** (greater visibility from main roads)	**Presence of structures/ infrastructure** (vacant site with no infrastructure is ideal)	**Compatibility of zoning** (commercial or mixed use zoning is preferable)	**Location in municipality** (relative to central core and/or areas of redevelopment)	**Total Score**
Albert & Montreal St	Imperial Oil MED	$72 250 $7.89/sq. ft	Corner on two major roads Downtown	Partially used as a parking lot	Commercial	Central	**16**
2nd & Brookdale	City of Cornwall HIGH	$87 250 $6.06/sq. ft	Corner on two major roads Off US bridge Provincial Highway!!!	Easement for a combined sewage line going through property	Vacant Commercial	Semi-removed	**11**
1102 Cumberland	Paul Michael (2017)	$109 000 $11.92/sq. ft	Corner, 2 major streets	Large structure suitable for commercial use	Retail 1 story Under 10000	In residential	**12**

	MED				sqft		
1616 Pitt Street	Petro Canada/ Suncor	Not given	Corner lot on Pitt/Emma street	Large structure suitable for commercial use	commercial Auto dealership - independent dealer or used vehicles	In residential	**11**
1901 McConnell Ave	Fifth Wheel Corporation - Jim Warren	$1.824M $3.57/sq. ft	Off 401 - 2 major streets	Vacant lot	Commercial	Removed	**14**
Vincent Massey Drive	Wesley Murray	$89 250 $5.54/sq. ft	Corner lot - only 1 major road	RVs on site	HWY commercial	Removed	**12**
755 Brookdale Ave - SOLD	Suncor Energy	$586 000 $9.47/sq. ft	Roundabout - 3 major roads	Testing wells on site	HWY commercial	Semi-removed	**13**

Appendix-C:

Site	Special Policies
Second & Brookdale: Beautification - Signage	**By-law 0577-1982:** iii.) Signs shall not exceed 15 square feet in area and in the case of freestanding signs they shall be placed not closer to the street than the required setback for building required by Bylaw 751-69 as amended. I.) Ground Signs, Fascia Signs, and Projecting Signs Value of Sign Fee $0.00 - $1000.00 $50.00 $1000.00 and over $9.00/$1000.00 over $1000.00 Note: There is a minimum permit fee of $50.00 **Bylaw 152, 1995:** Freestanding Signs:

	Maximum aggregate area shall be 425 sqft + Maximum height: 33ft 6 feet from any side yard - 1sqft of sign area per 1 foot of lineal frontage abutting for first 150 feet - 0.5sqft additional sign area per 1 foot of lineal frontage abutting a street in excess of 150 feet **OP 2.6.3 Goals General:** #36 Improve the visual qualities of the City.
1901 McConnell : Interim - Flexible Event/Commercial Space	**OP 2.5.1.19:** Promote and encourage food security efforts in an increasingly important urban-based sustainable food system. **OP 2.5.1.20** In support of more self-reliant community living, promote the use of new technologies / emerging techniques for healthy and sustainable urban-based food production **OP 2.6.3 Goals General**: #30: Continue to maintain and develop comprehensive parks and open space system providing recreational opportunities and facilities to meet the recreational needs and demands of all sectors of the population. #33: Encourage and promote Tourism attractions and identify tourism potential through the development of a comprehensive long-term Tourism Strategy for the City. #36 Improve the visual qualities of the City. **OP 4.4.2 Commercial Land Use Goals** 5. Carefully locate highway oriented businesses while ensuring the efficient operation of arterial streets and highway interchanges. **OP 4.4.3 General Policies**: 7. Encourage the appropriate re-use of abandoned service station sites. 8. Investigate or request Government rehabilitation and improvement programs for commercial areas if such programs are available. **OP 4.6.2.2. Highway Commercial** This zoning subcategory shall mean those areas with uses and facilities which primarily serve the travelling public, such as automobile oriented and automotive facilities, tourist facilities, eating establishments, indoor recreation establishments, motels, hotels, drive-in facilities or to accommodate large, extensive and low intensity commercial activities which may not be conveniently accommodated elsewhere, such as restricted factory outlet retail malls in specified areas only. Highway Commercial zoning is generally located in proximity to highways and along major arterial roads. **Parking, Loading: Amusement + Theme Park; Fairground; and Tourist Attraction**: 20 parking spaces for every hectare of land used for such purposes (Parking-Loading Subsection 01-3)
Montreal	**OP 4.4.2 Commercial Land Use Goals**

Road & Albert Street: Redevelopment - Mixed-use Development	10. Promote high standards of urban design in commercial areas of the City. **OP 4.4.3 General Policies**: 7. Encourage the appropriate re-use of abandoned service station sites. 8. Investigate or request Government rehabilitation and improvement programs for commercial areas if such programs are available. **OP 4.5 Business District** 5. Encourage the use of land and buildings in the Business Districts for retail, office, institutional, Government, residential and recreational purposes and provide the public works, services, facilities and amenities required to support the development or redevelopment of land and buildings for such uses and activities at the highest densities practical within the City of Cornwall. 6. Encourage the intensification and consolidation and not the horizontal expansion of the Business Districts through: a) re-use of floor space in the upper storeys of buildings; b) the appropriate infilling of the interiors of city blocks; c) the redevelopment through adaptive re-use of underutilized sites; d) generally by permitting more intense and major projects in Business District areas, and e) the continuity of ground floor retail uses and store fronts shall be maintained and extended in order to reinforce a pedestrian orientation. 10. Encourage more housing units in the Business Districts in order to support the commercial function and provide more diverse areas through: a) providing zoning bonuses for development projects which contain housing units; b) encouraging mixed use developments containing retail and office uses on the bottom floors with apartments on the upper floors; c) allowing existing commercial buildings or parts thereof to be converted into multiple dwelling units; 16. Ensure that appropriate parking facilities are provided in the Downtown and Le Village Business Districts by: a. maintaining an on-site parking and bicycle parking requirement through zoning provisions; b. preparing or updating and implementing a Master Parking Plan for off street parking facilities, which encourages the design and construction of contiguous paved, privately owned communal rear yard parking lots, and in conjunction promote increased rear store beautification programs including the use of expanded rear door customer access to stores and restaurants, all of which will make intensification sites available for redevelopment and expansion of facilities in existing Business Districts; c. encouraging private developers to provide underground parking structure(s). **COM 70: 03-7-3 MINIMUM YARD DIMENSIONS** No front yard shall be required for a lot fronting on the north side of Montreal Road; and no front yard shall be required for a lot fronting on the south side of Montreal Road between Marlborough Street and Belmont Street. No front yard shall be required for a lot fronting on Water Street between Gloucester Street and Marlborough Street. 20 feet shall be required elsewhere in this Zone.

	Side yard: Nil Except that a corner lot which required a front yard of 20 feet in accordance with the above shall have a side yard of not less than 10 feet on the minor street. Rear yard: 25 feet **Parking, Loading: High intensity:** - Le Village and CBD 50% of standards - 1 parking space for every 28 sqm (300 sqft)

Appendix-D: Proforma

Due to layout size, please see attached PDF.

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