Large-scale Brownfields: An Issue and Policy Analysis

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Abstract

Large-scale brownfields are more complicated and more difficult to develop than small-scale brownfields due to the different barriers to development that they have. Their barriers include: greater and more complex contamination issues, their increased size results in a more difficult remediation process, and they are often situated in areas and municipalities that are experiencing economic disinvestment. In order to develop large-scale sites these barriers need to be addressed. Looking at three sites, in Cleveland, Ohio, Buffalo, New York and Sydney, Nova Scotia, comparisons can be made between how the different barriers to development were addressed on each site. Each of the sites were well studied and planned, received aid in terms of funding and expertise from higher levels of government and employed some form of innovative practice to attract developers and make the site unique. Analysis of the Greenwich- Mohawk site in Brantford, Ontario reveals that Ontario’s brownfield policies do not appreciate the complexities involved in large-scale brownfields. Ontario introduced new legislation to promote smart growth which identifies the development of brownfields as a priority; however they did not provide new policy tools to help municipalities accomplish these new goals. Two recommendations are offered: first to increase the amount of tax incentives that municipalities can offer in order to attract developers and entice them to adopt the risk associated with large-scale sites, second the province should have programs set up to provide funding and expertise to municipalities trying to develop their large-scale brownfields.
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1.0 Introduction

Brownfields have become a serious issue throughout the United States and Canada over the past 40 years. These sites are difficult to develop because they have inherent barriers that inhibit their development. Ontario has sought to address brownfields by introducing policies to break down the barriers to development. These policies however are primarily focused on small-scale brownfield developments. Large-scale brownfields have a more complicated set of barriers to their development and tend to have a larger impact on the municipalities they reside in. Brownfield policies in Ontario do not take into account these complexities and thus do not address large-scale brownfield sites or aid municipalities in their development. This paper contains 4 main sections. The first section is an overview of brownfields, their inherent barriers and the benefits provided by their development. The second section is a comparative analysis of three different large-scale brownfield sites, looking at their issues, and the processes that were used to address them. Third is an in-depth case study of the Greenwich-Mohawk brownfield site in Brantford, Ontario, which will provide the context of large-scale brownfield development in Ontario. The final section is an analysis of Ontario’s brownfield policies, outlining how they operate, their limitations, and recommended changes that can be made in order to better target large-scale brownfields in Ontario.

2.0 Overview

2.1 Factors Contributing to Brownfields

The most common definition of brownfields comes from the United States Environmental Protection Agency (US EPA) who define brownfields as “a property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential
presence of a hazardous substance, pollutant or contaminant” (US EPA, 2015). Two phenomenon, de-industrialization, the movement of industries out of developed areas, and suburbanization, movement of development from city centres to suburban areas, have contributed to the steady rise in brownfields that has been occurring since the 1970’s in the United States and Canada (Wang et al., 2011; Kurtovic et al., 2014). Globalization over the past 40 years has contributed to a decline in industrial activity in Canada and the US and the industries that have remained have experienced a trend of moving from urban centres to suburban areas (Kurtovic et al., 2014). These two trends have left a legacy of contaminated sites in urban centres (Wang et al., 2011). The Canadian Federal Contaminated Sites Inventory (FCSI) has calculated that 22,874 sites throughout Canada have been identified by: departments, agencies and consolidated crown corporations, as contaminated or potentially contaminated (TBCS, 2016). The US EPA estimates that there are more than 450,000 sites throughout the US (US EPA, 2015). All levels of government have struggled with how to encourage the redevelopment of brownfields by addressing the barriers to development in brownfields.

2.2 Barriers to Brownfield Development

The inherent issues and complexities surrounding brownfield developments become apparent when examining the definition stated above. These complications, or barriers to development, stated in the definition fall under three main categories: contamination, remediation and disinvestment. The proven presence of contaminants is not a requirement in the classification of a property as a brownfield rather a brownfield just requires the perception that contamination could be present. Even the perception of contaminants is enough to deter interest from developers because a stigma has been developed around brownfields. Many developers are
nervous about investing in brownfields due to the environmental and public health liabilities that could arise due to contamination. This nervousness is compounded by the fact that usually the extent of contamination, even whether there is contamination or not, is not known before a developer purchases a brownfield and performs a site assessment (Attoh-Okine and Gibbons, 2001).

The second complication is performing remediation. Once a site assessment has identified that there are contaminants present on the site or in the soil beneath the site a developer is liable to perform an environmental remediation. There can be great variation in the potential cost of a remediation based on the degree of contamination, the specific contaminants present and the types of materials that need to be remediated. For example sandy soils can be much more expensive to remediate than clay soils (Murray and Rogers, 1999). Also when groundwater contamination has occurred on a site cleanup costs are significantly higher (Murray and Rogers, 1999). Costs are also dependant on the environmental standards that the remediation is liable to meet. Standards can vary greatly between regions, based on government policies, and can be a key factor on where developers choose to invest. Furthermore the cost of remediation is not the only factor that makes remediation a complication in the brownfield development process. As the severity of contamination increases the remediation process becomes exponentially more difficult as contamination can be increasingly hard to recognize and therefore harder to remove from a site. Bigger projects often involve a greater number of stakeholders, and more responsible parties where greater conflict can arise further prolonging and inhibiting the development process which increases costs and decreases the value of a developer’s investment (Daley and Layton, 2004). This is why investing in brownfield property is a risk for developers.
The third complication in brownfield development is the greater economic environment in the area surrounding the brownfield property. While brownfield sites can be singular sites close to a vibrant urban centre they can also lay within a neighbourhood that is faced with broader disinvestment. A brownfield can be a major blight on a neighbourhood, devaluing property values around the site. Mihaescu and von Hofe (2012) studied how brownfield sites in Cincinnati impacted nearby property values. They identified that when compared to properties 1000 feet away from the brownfield adjacent properties were 22% less valuable and properties 500 feet away from the site were 6% less valuable. This has a negative impact on both property owners and municipalities, as reduced property values decrease their income from property taxes. This can cause a spiral of disinvestment where reducing property values in the neighbourhood reduces municipality income, which further reduces the amount the city can invest in the area further reducing value. This cycle deters developer investment in the area as their development would also be impacted by the cycle and be reduced in value. In many cases, such as in Buffalo, Cleveland and Brantford, major industrial and manufacturing centres have witnessed the loss of their key industries over the past 20 years which has left an economic scar on the city and resulted widespread job loss and economic downturn which perpetuates this cycle (City of Cleveland, 2013; City of Buffalo, 2015; Tran, 2016) The cycle can be broken but it requires a significant planning and investment to be accomplished.

2.3 Benefits of Brownfield Development

While multiple barriers to development can hinder the successful development of brownfield properties there are a range of economic, environmental and social benefits in the completion of brownfield projects. Economic impacts of redevelopment can benefit all
stakeholders. The government benefits by an increased tax base from both the reuse of previously vacant land and from counteracting the negative impact the brownfield had on nearby property values. In cases where the brownfield had fallen into municipal ownership redevelopment also benefits the government by relieving the potential liability concerns that can arise with brownfields. The public benefits by the creation of new jobs in the remediation, construction and also from the development itself if applicable. The developer can benefit by completing a brownfield development instead of a greenfield (undeveloped land) development by receiving incentives from the municipality and brownfields can be in more ideal locations than greenfields.

Remediating brownfields is also important for the environment. Site remediation has a wide range of environmental benefits that depend on the site location. Ground water systems experience a direct benefit of the removal of contaminants in the soil. Ground water is a key method of contaminants spreading out from the site and into surrounding environments, such as streams, ponds and rivers where an influx of contaminants can severely impact their ecology (Murray and Rogers, 1999). The ability of contamination transportation is dependent on the type of soil on which the brownfield resides and the physical chemistry of the contaminants themselves and thus the environmental impact of each site vary widely (Kaufman et al., 2003). Remediation of brownfield sites that lie on clay soils can be cheaper and benefit more than remediation of sites that lie on sand or moraine deposits (Murray and Rogers, 1999). The longer a site remains contaminated, regardless of the types of soil, the greater the environmental impact of that contamination can be as conditions will continue to degrade and the eventual remediation
will be increasingly complicated and expensive (Murray and Rogers, 1999). Remediation can have a high variability in cost and effectiveness based on the site’s characteristics but it is always a worthwhile venture as it both repairs the environment and prevents future damage.

There are many social benefits that can accrue due to the development of brownfields. These usually accrue over longer time periods, after a project has been completed and are more difficult to quantify. Cleaning up brownfield sites provides social value by removing possible public health concerns due to contamination, hazardous materials or derelict buildings, especially children who may unknowingly play in contaminated land or dangerous buildings. The Sydney Tar Ponds, which will be discussed in the next section, are an extreme example of how brownfields can pose health risks as significantly hazardous levels of contaminants spread to surrounding neighbourhoods (Canadian Press NewsWire, 2001). The development of brownfields counters urban sprawl by being an alternative to greenfield development. Brownfields are often closer to urban centres promoting municipal densification by providing closer access of jobs and services. Urban sprawl is a key contributor to traffic congestion, increased infrastructure costs, and the lack of affordable housing near employment opportunities (Downs, 1999). It also encourages the loss of agricultural and environmental land near to urban centres reducing access to locally grown foods and the important recreational services that nearby environmental areas provide (Downs, 1999). Developing brownfields is one of the most effective ways to counter urban sprawl and promote more sustainable development strategies. Brownfield development has an inherent ability to spark an area-wide revitalization by countering the cycle of disinvestment discussed in section 2.2. Improved property values, re-investment in infrastructure and renewed property investment can all result from the completion
of a brownfield project improving an entire area (US EPA, 2014). Area-wide revitalization can also enhance many of the other benefits that have been discussed in this section by creating a desirable area for economic and municipal investment. These numerous benefits of brownfield development can offset the barriers to their development and make it worthwhile for municipalities to encourage them and for developers to invest in them.

2.4 Specific Issues with Large-Scale Brownfields

Due to globalization, contributing to the trends of suburbanization and de-industrialization, industries that were previously centre pieces of North American towns and cities have closed down and moved overseas (Kurtovic et al., 2014). This migration of manufacturing industries has left municipalities with entire industrial complexes that have been abandoned or severely underutilized. These large-scale brownfield sites have a more complicated set of barriers to their development. They are often more difficult to remediate due to their size and because they are often the result of older industrial complexes closing which have had a variety of industrial uses. As mentioned earlier contaminants are able to migrate through the soil which makes the remediation of just one section or plot of the site impossible. Remediation must be done on the entirety of a large-scale site which is a task that is often too risky and too vast for a single developer to adopt themselves. Their age and the variety of activities that these brownfields have experienced results in a much higher risk that contaminants from several different sources are present in the site making remediation more, difficult and expensive. Major industries closing are a key contributor to disinvestment in a neighbourhood and the increased barriers to development can mean that they lie unused and negatively impacting an area for longer periods. Disinvestment dissuades incoming initial developers because it devalues any
investment they would make until other investment in the area occurs. These barriers make large-scale brownfields more challenging to have developed but can also provide greater benefits when they are. The next section will analyze three different municipalities and how they planned to develop their large-scale brownfields.

3.0 Comparative Analysis

Municipalities who are seeking to have their large-scale brownfields developed need to address the barriers to development that are involved with their site. For this reason these brownfields often require a greater amount of research and study into the history of the site, the environmental conditions and the barriers to development that exist. This study is often necessary because the municipality needs to address and attempt to reduce their barriers as much as possible in order to attract developers. The completion of studies and the creation of brownfield development plans however cost money and require expertise. Combined with any initial actions to reduce barriers, developing large-scale brownfields is expensive especially for a municipality struggling with the effects of large-scale brownfields. In order to successfully develop these brownfields higher levels of government need to provide aid whether through grants or programs or through more direct involvement. This analysis looks into three large-scale brownfield sites and analyzes; how the inherent barriers to development were addressed, how provincial/ state or federal governments provided aid to municipalities, and it also analyzes the innovative techniques that were used in order to make the site stand out and spark development.

3.1 Cleveland

The Cleveland Opportunity Corridor (COC) is a brownfield development project in the South-East of Cleveland that focuses on a roadway extension, by the Ohio Department of
Transportation, of the interstate 490 (Fig: 1). This roadway extension runs through a series of neighbourhoods that have serious brownfield issues. The goal of the COC is to connect South-East Cleveland with the already fast growing education and medical district centred on Case Western Reserve University and the Cleveland Clinic (known as Eds and Meds) (City of Cleveland, 2013). The city will use the roadway project, the connection to Eds and Meds and the COC development plan to leverage renewed development in the neighbourhoods around the roadway which are plagued by disinvestment and underutilization. The COC is a compilation of a series of programs, plans and studies and has federal, state and municipal interest.

Fig 1: Cleveland Opportunity Corridor Roadway Project area with planned roadway in black with the 9 development districts linked to this project. Districts 2-5 in red are the 4 districts selected to be part of the Area-Wide Plan (City of Cleveland, 2013)
The COC is part of the United States Environmental Protection Agency (US EPA) Brownfield Area-Wide Planning Pilot Program. The pilot program was established to provide funding to municipalities with large scale brownfield issues (either through single large-scale sites or through a high concentration of sites) where the surrounding area has also been negatively impacted (USEPA, 2014). Projects within the program (including the COC) are designed to focus on not only the brownfield itself but to take a wider perspective and work towards greater revitalization of the neighbourhoods affected by the resulting de-investment due to the proximity to the brownfield (City of Cleveland, 2013). In order to accomplish this, the program encourages community-based partnerships especially concerning the brownfield development plan (City of Cleveland, 2013). The program provides a maximum of $175,000 in order to develop the Brownfield Area-Wide Plan (US EPA, 2014). Cleveland, which was one of the 23 selected cities to be part of the pilot program, used the opportunity the program presented to expand the scope of the Opportunity Corridor in order too incorporate a wider community development perspective.

The area-wide plan is the greater developmental plan designed to operate in parallel with the COC roadway project. The COC area-wide plan created nine development areas in order to identify and direct development in conjunction with the roadway project (depicted in Fig: 1). Due to the budget limitations of the of the pilot program the area-wide plan focuses on the centrally located districts of 2,3,4 and 5 (highlighted in red in Fig: 1) and studies the “strategic redevelopment of underutilized and potentially contaminated lands” in these 4 districts which become the study area of the area-wide plan (City of Cleveland, 2013). The study area has a
plethora of abandoned and derelict buildings with 163 buildings in poor or moderate condition representing 87% of buildings in the study area (City of Cleveland, 2013). Vacant land occupies 55% of the study area and the Cuyahoga County, City of Cleveland partnership Landbank already owns 382 properties representing 40% of the Study Area (Fig:2; City of Cleveland, 2013).

In order to facilitate the redevelopment of these derelict buildings and vacant land each of the development districts have been identified with a preferred use in order to focus and attract specific development. These preferred uses have been established over years of planning through various planning exercises. The eastern development districts have been identified for biomedical and office uses due to their proximity to the growing Eds and Meds district. The western development districts have been selected for shipping and transportation businesses due to the ease of access to multiple interstates. The central districts are the largest districts and have thus been selected for a range of light industry uses including warehouses and logistic facilities due to their ability to host larger lot developments (City of Cleveland, 2013). District 4 has, through past initiatives, been devoted to urban agriculture and has already begun with the completion of the Green City Growers greenhouse (City of Cleveland, 2013). The preferred development uses for the districts seek to reduce barriers to development by easing the approval process for conforming developments.
Several alternatives were put forward for the precise layout of the COC roadway project. The decision of the final layout was based upon extensive input from “those who live, work, own business or have other special interests in the [project area]” (Ohio Department of Transportation, 2014). Out of the four main alternatives one was discounted because it would be too intrusive to the existing community including churches and cemeteries. One, proposed along the railway line would be isolated and thus unable to provide the economic benefits to the surrounding area (Ohio Department of Transportation, 2014). The final plan was chosen because it would be able to provide the greatest opportunity for economic benefit with the least detriment to the surrounding community. The chosen alternative was designed so that the roadway would be constructed over top the properties that are most likely to have high contamination levels.
(City of Cleveland, 2013). This innovation to utilize contaminated lands enables the city to further reduce the barriers to brownfield development for two reasons. First with less contaminated properties in need of development there is less risk to developers that they will be saddled with large remediation bills. Second with less risk to developers it is more likely that properties will be developed at a higher rate which provides greater economic benefits for all developments and further encourages development.

3.2 Buffalo

Buffalo was once one of the most populated and industry based cities in the United States. However in the past 80 years its population has dropped by 55% while the rest of the country has experienced extensive population growth (Gleaser, 2007). Its primary industry throughout this time, manufacturing, has similarly declined since the 1950s leaving behind abandoned factories, vacant land and severe contamination issues (City of Buffalo, 2015). Due to the lax environmental regulations during Buffalo’s economic peak many of these sites represented serious contamination concerns. The majority of Buffalo’s brownfields lie in the South End of the City, along the waterfront and riverside. Buffalo, as part of the New York State Brownfield Opportunity Areas (BOA) Program, has identified three BOAs in this area, Buffalo Harbour, Buffalo River Corridor and South Buffalo. This analysis will focus on the South Buffalo BOA describing the programs and innovations which buffalo used in order to spark interest and development in one of their most sever brownfield areas.
The South Buffalo BOA is a 2,000 acre area site divided into 4 main sectors: Riverbend, TIFFT Nature Reserve and Sustainability Centre, Buffalo Lakeside Commerce Park, and South Buffalo Golf Course (Fig: 3; City of Buffalo, 2015). Over 500 acres of the BOA is vacant land with 350 acres of which is publicly owned. South Buffalo has been a focus of research and remediation over the past 20 years (City of Buffalo, 2009). The city reports that the bulk of publicly owned land has been remediated and is ready for development.

Fig: 3: Arial photo of the South Buffalo BOA with the 4 main sectors labelled: Riverbend, TIFFT Nature Reserve, Buffalo Lakeside Commerce Park and the South Buffalo Golf Course (City of Buffalo, 2015).
The New York State Department of Environmental Conservation funds the Brownfield Opportunities Area Program in order to provide aid to municipalities struggling with brownfield sites through grants and technical assistance in order to complete strategic plans and site assessments. The program is a three step process involving a pre-nomination study, Nomination Report and Implementation Strategy Report (DEC, 2016). The completion of this process and the receiving of funds and expertise can be extremely beneficial to a struggling municipality that does not have or cannot devote the resources necessary to address their brownfield issues.

Buffalo has four BOAs throughout the city representing the deep decline the city has experienced, especially in its manufacturing industries. Buffalo has also committed to sustainable development with the Buffalo Green Code which will be completed in 2016 (City of Buffalo, 2015). The Green Code is a planning initiative that encompasses, land use planning, revitalization plans, urban renewal plans and BOA management (Buffalo Green Code, 2016). The Green Code thus collects all aspects of development and land use planning in one place and with a unifying framework around three main goals: grow the economy, strengthen neighbourhoods and repair the environment. A comprehensive plan with these goals aids in the process of brownfield development as it commits to a certain standard of development and guides the type of development that will occur in the city.

Buffalo completed the Implementation Strategy for the South Buffalo BOA in 2015. The report outlined the unique methods that Buffalo has used to address redevelopment in the South Buffalo BOA. The BOA has two main focuses the first is infrastructure improvements in order to attracting outside investment, the second is to diversify the buffalo economy by supporting the growth of a new technology and green energy manufacturing sector (City of Buffalo, 2015). All
public investment in the BOA is to be done on a principal of lighter, quicker cheaper (LQC). LQC is a method of development of making fast, low cost investments in order to generate new outside investment which in turn would attract more interest (City of Buffalo, 2015). Under this model public investments act as a catalyst for a domino effect of outside investment therefore maximizing the beneficial impacts of relatively small investments.

The South Buffalo BOA was also selected to host a new high-tech Manufacturing Innovation Hub at Riverbend. The creation of this hub was a combined effort between the city of Buffalo and New York State and was to spark a new industry focused around high-tech and green-energy manufacturing and innovation. New York State, in partnership with SolarCity, have invested $1.5 billion “to create the largest solar panel manufacturing facility in the Western Hemisphere” (City of Buffalo, 2015). This substantial investment is estimated to create 1,500 direct new jobs along with 1,500 indirect jobs in related businesses that would migrate to the city (City of Buffalo, 2015). This investment could drive the creation of an entire industry in buffalo by creating a demand for new businesses that support and are linked to green-energy technology. Due to the state of disinvestment in Buffalo this type of state investment was essential for revitalizing the Buffalo economy.

3.3 Sydney

Sydney Nova Scotia is a town on Cape Breton Island whose social and economic history has been dominated by the Sydney Steel Corporation. The steel mill was built in 1901 and was the primary employer of the town. The mill was closed down in 2001 leaving both a municipality struggling with a lack of employment and a site that has a hundred years of compounding
There are several negative by-products associated with steel production including polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs) and heavy metals (Joint Review Panel, 2006). These pollutants were deposited over the past century in two sites, the Sydney Tar Ponds and the Coke Ovens site which were classified as one of Canada’s most contaminated sites (OAE, 2013). The severity of the contamination and the public health concerns sparked the Sydney Tar Ponds and Coke Oven Sites Remediation Project. The total project area was 274.1 acres, situated on a marine estuary and surrounded by the town of Sydney making it significant both in terms of public and environmental health (AECOM, 2013).

The project was a cost share initiative between the federal department of Public Works and Governmental Services, and the provincial Department of Transportation and Infrastructure Renewal. In total the governments provided $400 million to the tar ponds remediation and set up the Sydney Tar Ponds Agency to utilize these funds and oversee the remediation process which was completed by AECOM. During the study two main methods were identified for treating the contaminants. The first method focused around removal and destruction of contaminated materials. In this method a temporary incinerator would be built off site and contaminated materials from the tar ponds would be shipped to it and destroyed (Joint Review Panel, 2006). While this method would remove the contaminants from the sites there is great concern about the environmental impacts of PCB and PAH incineration (Joint Review Panel, 2006). The second method remediates the sites by addressing contaminants in place through containment and stabilization techniques. Containment methods seek to eliminate the leeching of contaminants into surface or groundwater sources by creating physical barriers around the site. Stabilization
methods solidify the hazardous organic compounds so that they can be stabilized in concrete. Stabilization is however an unproven technology and concerns arose in its use for the tar ponds (Joint Review Panel, 2006). The final remediation process used the on-site methods of containment and stabilization before being capped to further prevent transport of contaminants (OAE, 2013). Public Works and Government Services’ final evaluation declared the site successfully remediated with minimal future damage to the surrounding environment (OAE, 2013). However there is considerable debate on the long term effectiveness of the containment and stabilization process and its use in the tar ponds citing the unproven reliability of the technology and the questionable ability of the containment structures to hold back contaminants over the years (The Canadian Press, 2013).

The tar ponds remediation differs from the other examples of large scale brownfields used in this analysis because this project was driven by public health concerns and government liability issues opposed the need for economic development. While remediation plans of the tar ponds have been studied since 1986 it wasn’t until 2001 when reports began to emerge revealing just how serious the contaminant issues were in the tar ponds and how far they had spread from the closed off tar ponds site that serious liability issues sparked renewed efforts to create a remediation plan (OAE, 2013). Soil samples in a neighbourhood close to the tar ponds revealed arsenic levels 71 times the federal government recommendations and other studies revealed that even two kilometres from the site arsenic levels 7 times recommended levels (Canadian Press NewsWire, 2001). These results not only posed a serious risk to residents (especially children) but spark outrage among residents, environmental groups and political organizations (Canadian Press NewsWire, 2001). Due to the federal ownership of the steel plant from 1968-73 and the
continued government subsidies the plant was provided up until its closure in 2001 the federal government has a direct responsibility for the impacts of the tar ponds (OAE, 2013). This responsibility and inherent liability prompted the federal government’s involvement and the $280 million they invested to the project.

3.4 Summary

The origin of the brownfield issues is different in each of these three cases; gradual disinvestment in Cleveland, the fall of a manufacturing economy in Buffalo, and the waste produced from a hundred years of steel production. These differences created three cases that had a wide array of social, economic and environmental variables however even with these differences comparisons can be made between the sites. As shown in Table 1 the same techniques were needed to address the different complex issues at each site. The issues were well studied, higher levels of government contributed to the projects and some form of innovative practices was used in order to encourage development.
<table>
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<th>Issues</th>
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<th>State/ Provincial role</th>
<th>Federal Role</th>
<th>Innovative Practices</th>
</tr>
</thead>
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| **Cleveland** | Widespread Disinvestment  
High density of brownfields and abandoned land  
High rate of municipal ownership  
Lack of connection to the rest of Cleveland | Area-wide plan is a compilation of past plans  
Focuses on the entire area to tackle greater disinvestment  
Formed community based partnerships | Municipal land bank owns 40% of the study area  
Main proponent of the Area-wide plan  
Organize and communicate between stakeholders | Ohio Department of Transportation is funding the roadway project  
Roadway connects to the Eds and Meds district and leverages other investment | US EPA Area-wide Planning Pilot Program provided $175,000  
Used to develop the Area-wide plan and establish community based partnerships | Roadway project runs over land estimated to have the most contamination  
Reduces the need for remediation  
Reduces chance of developers having large remediation bills |
| **Buffalo** | Departure of manufacturing industry over the past 50 years  
Large amount of vacant land | 3 part study process of the BOA program  
Pre-nomination, nomination report and implementation strategy provide significant study into the area | Municipality owns a 350 acres of vacant land  
Organized the planning of the BOA  
Major stakeholder in the creation of the Manufacturing Innovation Hub | New York State Brownfield Opportunity Area program funded the studies  
New York State is a direct investor in the creation of the Manufacturing Innovation Hub  
State developed partnership with SolarCity | Not applicable | Most of publicly owned land has been remediated  
$1.5 Billion investment from the State and SolarCity to develop the solar panel factory created over 3000 jobs and drive the creation of a new industry |
| **Sydney** | Extreme contamination issues caused by a century of steel production  
Contamination spreading from the site into residential neighbourhoods  
Significant risk to human health, especially among children | Has been studied various times since 1986  
Studies in 2001 shed light on the spread of contamination and the danger to human health sparking remediation activities | Small municipality that has been crippled by the closure of the steel mill | Major funder of the remediation due to the risk to public health  
Contributed $120 million to the project  
Contributed expertise to the planning and remediation process | Major funder of the remediation due to the years of Federal ownership of the mill and years of federal subsidies  
Partly responsible for the contamination issue  
Contributed $280 million to the planning and remediation of the sites | Stabilization and solidification methods stop the spread of contaminants and reduce human health impact |

Table 1: Comparative table of the issues of each site and how they were addressed through study, governmental action and innovative practices
4.0 Brantford Case Study: Greenwich- Mohawk Site

4.1 Introduction

Brantford grew over the past 150 years as a city of industry. This industry has left a lasting legacy of abandoned properties and contamination as the primary industry of farm machinery manufacturing collapsed in the 1980s. The legacy remains at sites such as the Greenwich- Mohawk brownfield just southeast of downtown Brantford. This section will explore the history of the site, the city’s process to try and get it developed and the issues the city has faced along the way and are likely to face as the process continues. In order to gain first-hand experience of the issues facing the city with this site I conducted an interview with Tara Tran who works for the City of Brantford as a policy planner and is the project manager for brownfield projects. The Greenwich- Mohawk brownfield site, its remediation and re-development, is currently one of her major projects.

4.2 History

Brantford’s development history was centred on its farm machinery industry. The industry’s presence in Brantford was founded when Alanson Harris moved his manufacturing business there in 1872 (Ball, 2013). Partnering with Daniel Massey, to form Massey-Harris, in 1891 sparked the growth of what was to be, by 1961, the largest manufacturer of tractors, combines and diesel engines in the world. The company expanded its market into the United States in 1911 and bought several European based companies. Re-investment in the city that held its roots occurred in 1964 when Massey- Ferguson opened a new 13.5$ million factory in the north of Brantford (Ball, 2013). Massey Ferguson’s presence in the city encouraged the
establishment of other farm equipment businesses in the city making the city the heart of Canada’s agricultural manufacturing industry. The industry formed an essential part of Brantford’s economic activity and tied the city’s economic welfare to the industry’s welfare.

The booming “City of Industry” slowed dramatically in the 1980’s as farmers across North America were hit with decreasing commodity prices and increasing interest rates (Ball, 2013a). In 1985 White Farm Equipment, which operated the Cockshutt plant, declared bankruptcy and on March 5th, 1988 Massey-Ferguson entered receivership with outstanding debts of over 290$ million (Marion, 2012; Ball, 2013b). The closure of these two industries had a profound effect on Brantford and by the end of the 1988 unemployment had reached 24% in the city (Dearlove, 2011). The collapse of these industries deeply impacted the city turning it from the “City of Industry” into a ghost town (Tran, 2016).

De-industrialization also left significant and lasting scars on the city’s landscape which includes the Greenwich-Mohawk brownfield site. The site is made up of three different properties, 22 Mohawk St., 66 Mohawk St. and 347 Greenwich St., which were formerly owned by Massey-Harris, Cockshutt Plow Company (later White Farm Equipment) and Adams Wagon Factories, totalling 50 acres just South-East of downtown Brantford (See Figure 4) (Brantford, 2016). Factories were first established on these properties at the start of the 20th century and saw nearly 90 years of intensive industrial activity. 22 Mohawk was also owned and operated by Sternson Chemicals which did various painting and steel coating activities which are credited for producing a significant amount of contaminants, especially lead (Tran, 2016). The site has been abandoned since the late 1980’s and early 90’s (Marion, 2012; Dearlove, 2011). The two
Mohawk addresses fell into municipal ownership due to tax arrears in 2003/04 and the Greenwich property followed suit in 2007 (Tran, 2016). These seizures left the city with 50 acres of land that was unsellable due to the significant barriers to development caused by significant contamination issues across a large site with tremendous expected remediation costs and de-investment in the surrounding area and throughout the city.

Figure 4: Satellite Image of the site and its location in Brantford (Google Maps, 2016).

4.3 Site Conditions

The brownfield site is situated just south-east of downtown. It lies between the neighbourhoods of Eagle Place to the West and East Ward to the North. These two neighbourhoods were once the primary residential areas of the employees that worked on the factories when the industries were still running and for a long time after their closure (Tran, 2016). The demographics of these neighbourhoods now is primarily young to mid aged residents
with low to mid income levels who have high school education and a few with college training (Tran, 2016). Houses are generally older single story bungalows (see Figure 5) and Tara Tran described the area as “a slightly more depressed area with pockets of really well kept homes” (Tran, 2016). Running through the site is the Toronto Hamilton and Buffalo Railway spur line which was instrumental in the transportation of goods produced on the site (Bantford, 2016). It is still in use now by one of the neighbouring businesses (Tran, 2016). Mohawk Canal bisects a corner of the Grand River that swings around to the south of Brantford. The canal was once essential for industry in the city and runs along the northern edge of the site. The groundwater system under the site is divided by the rail line. Groundwater on the northern side of the line flow into the Canal, water on the southern side flows to the Grand River (Tran, 2016). Just downstream along the canal is Mohawk Lake. Both the canal and the lake have contamination issues likely caused by groundwater transportation of contaminants from the brownfield site into the canal (Tran, 2016).

Figure 5: Houses in Eagle Place close to the site (Joyce, 2016).

One of the old industrial properties neighbouring the site on Mohawk St. is being used by Triple M Metal a scrap metal yard. There are several old buildings on the property with tired facades giving a rundown look (Figure 6). Further down Mohawk St. on the other side of the scrap yard is the Woodland Cultural Centre which was established in 1972 to protect aboriginal
culture and now operates as a museum and to provide support for First Nations Artists (Woodland Cultural Centre, 2016). The Six Nations of the Grand River own a large amount of land to the east of the site, where the centre is located, and to the north-east across the Mohawk Canal.

Figure 6: Buildings of Triple M Metal (Joyce, 2016).

Various site assessments have been completed on the three properties over the past 15 years. The most recent phase II site assessments, completed in 2014 on each of the properties before remediation had begun, outlined the condition of the soil and groundwater. Soil conditions across the three properties showed significant levels of contamination for a wide range of contaminant types. 484 soil samples from 209 locations across the three properties revealed 41 different contaminants as being greater than the MOECC standards (CH2MHill, 2014a; CH2MHill, 2014b; CH2MHill, 2014c). Four main categories of contaminants are present: metals and inorganics, Petroleum Hydrocarbons (PHCs), Volatile Organic Compounds (VOCs), and Polycyclic Aromatic Hydrocarbons (PAHs). Of particular importance are the high concentrations of lead in the 22 Mohawk St. property which at one location were 1,200 times higher than the MOECC standards and 17 other locations on the property where concentrations were 10 times the standard (CH2MHill, 2014b). PHCs were prominent across all three properties with 62 locations having concentrations higher than the MOECC standards.
Contaminants have also infiltrated the groundwater beneath the site. PHCs and VOCs were the only contaminants evident but they were highly prominent in the groundwater of all three properties.

4.4 Development Process

Through the process of failed tax sales the City of Brantford acquired the three properties in 2003/04 and 2007 and were left with the difficult decision of what to do with them. Shortly after acquiring the first two properties, 22 and 66 Mohawk, the city tried to sell them with no interest (Tran, 2016). The city started realising that developing interest for the properties would be extremely difficult in their current state and that they would have to address the barriers to development before they would be able to find a buyer willing to adopt the site’s issues. Also during this time the city identified, through meetings with the community and with knowledge that industry in the modern era needs easy access to highways, that the future use of the site would not be zoned as industry (Tran, 2016). In the meantime however the site was falling into greater disrepair, and was open to a host of illegal activities including chop shops, vandalism, dumping and arson (Tran, 2016). There were several large fires that occurred on the site while it lay unused. The first was a large tire fire where tires, which had slowly collected over the years, were set ablaze. The second fire occurred in the Cockshutt timekeepers building which was designated a heritage building and only a small portion of the building survived (Figure 7). These illegal activities spurned the city and the surrounding community into finding a solution for the site (Tran, 2016).
In 2007 the city acquired the third property, 347 Greenwich St. meaning they now owned all three abandoned properties that form the 50 acre site. At this time they tried again to find a developer willing to purchase the site and remediate the site by sending out a request for proposals (Tran, 2016). Several companies showed interest in the site but by the deadline only one proposal was submitted by Terrasan Corp. a Toronto based company. The proposal however was complicated by negotiations over the land value, municipal incentives and the uncertainty surrounding the remediation. These negotiations were further complicated by the economic downturn that occurred in 2008 and 2009 which likely contributed to the uncertainty felt by both parties. The deal eventually fell through after two years when Terrasan declared bankruptcy (Tran, 2016). This process was significant as it, and the previous attempt to find a buyer, persuaded the city that they would not be able to find a developer willing to buy the site as is so they began to look at what options were available to them to reduce the barriers that were preventing the site from development (Tran, 2016).
After the negotiations with Terrasan fell through, city council decided that instead of repeatedly going through this process in hopes of finding a developer willing to adopt the various problems brownfield site, they would address the sites issues themselves. The council committed to remediating the site to the Ministry of Environments standards to ensure that the site would be able to compete with greenfield properties (Tran, 2016). Once this decision was made they had to figure out how they would pay for the estimated $41 million cost of remediation. The city was able to raise $5 million from the province and $12 million from the federal government. These grants are primarily credited to the efforts of councillor Marguerite Ceschi-Smith who continually lobbied both the federal and provincial government for support in the remediation of the site (Tran, 2016). The remaining $24 million was garnered through a loan to the city from private institutions and grant providers such as Infrastructure Ontario and Green Municipal fund (Tran, 2016).

With funding secured the city began the process of remediation. The first issue was whether or not to demolish the buildings that remained on the site. The city did a heritage assessment to find if any of the buildings had any heritage value but found that any value would come at great expense to restore the buildings. The choice was made to demolish all the buildings on the site, except for the Cockshutt timekeepers building that had already been declared a heritage building, as it gave the city greater options in terms of available remediation strategies (Tran, 2016). Demolition was completed in 2013. Shortly after the phase I and II site assessments were performed and completed by CH2MHill. These assessments were necessary in order to understand the specific contamination issues, described above, and to be able to understand what remediation strategies would be effective. The city, under the advice of
CH2M Hill, the organization selected to perform the remediation, decided to remediate the soil using bio-piles, some offsite excavation and risk management techniques (see Figure 8; Tran, 2016). The bio-piles target the PHCs and VOCs in the soil, and off site excavation will remove as much of the lead as possible. The remaining contaminants will remain on site but will be capped. This risk assessment strategy is designed so that the remaining contaminants are contained and no longer a risk to public or the environment (Tran, 2016). These measures should be completed by June 2016 and will be followed by groundwater remediation.

![Figure 8: Remediation on the Greenwich-Mohawk brownfield site (Joyce, 2016).](image)

Once these remediation measures are completed the city believes that the site should be readily available for development and the next task is deciding what use the development will be. Through public consultation processes the city has learned that the neighbouring communities preferred land use for development of the site would be some form of recreational green space. However development of the site represents an important part of Brantford’s long term...
development plan. As of now Brantford is not meeting the targets set out in the Growth Plan for the Greater Golden Horseshoe (Tran, 2016). Whatever development goes into this site it will be a major feature in the city fulfilling both having 40% of all development already in the developed area and meeting population and residential density targets (Tran, 2016). The choice will come down to council what type of development will be approved for the site.

4.5 Issues Faced

Through their development process Brantford has faced a variety of different issues surrounding the development of the Greenwich-Mohawk brownfield site. Foremost was the scope of the site. At the onset the size of the site and the knowledge that most likely the entire site would need to be remediated, even without proper site assessments being completed, were enough to discourage developers from investing in the site. The early stages of the development process were also impacted by the city not acquiring the three properties at the same time as there was uncertainty as to what would happen with the other properties. Once all three properties were acquired in 2007 and the various site assessments that had been completed on each of them were compiled the true extent of the site’s contamination issues was truly understood. One hundred years of industrial activities had left a serious contamination issue both in the amount of contamination and the wide range of contaminants present. The high concentrations of lead were especially problematic as lead is incredibly difficult to remediate. The city’s decision to use a risk management strategy to target the lead in the soil is a cost effective way to address the issue however the issue may arise again if the management systems fail (Tran, 2016). The extent of groundwater contamination is a complicated issue because, as mentioned earlier in section 2.2, groundwater contamination is much more difficult to remediate.
than soil contamination. This issue has already been partly addressed by installing an interceptor trench along the southern edge of the site along Mohawk St. This prevents contamination in the groundwater coming off the site to be deposited into the Grand River. The provincial government paid for the installation of the interceptor trench recognizing that the spread of contaminants into the Grand would become an issue for the entire watershed downstream of Brantford (Tran, 2016).

When Brantford acquired these properties they inherited a serious problem from the past users of the site. Despite the serious nature of the problem and the risks contamination posed to public health the city received no support from higher levels of government in understanding the issues surrounding the site and aide in planning its development. When the city finally received support from the provincial and federal governments well into the development process it was due to the persistent lobbying from a city councillor (Tran, 2016). As discussed in the comparative analysis studies early on in the development process are extremely important and make the whole process smoother and municipalities struggling with large-scale brownfield issues often cannot fund these studies themselves. The development process of Brantford’s site could have benefited from a study conducted at the beginning of the process.

There are several issues that the city is still likely to face as it proceeds with the development of the site. The city, with consultation with the community, decided in 2004 that it did not want the site to be used for industrial purposes anymore and so they started a process to change the designation from industrial to mix use. However that process was appealed to the OMB by the neighbouring scrap metal industry (Tran, 2016). The city has not moved forward
with the change of designation but the appeal remains outstanding as well. When the city eventually moves forward with this change of designation when as they move ahead with the development process they will have to address and seek a solution to this appeal or else rely on the OMB’s decision which could block the designation change (Tran, 2016). Another possible issue arising is opposition from First Nations groups as they are a major land owner in the area. According to Tara Tran (2016) the city has a good relationship with the elected leaders of the Six Nations of the Grand River however there are apparently other groups that do not necessarily recognize the elected leaders and could provide problematic opposition to development of the site (Tran, 2016). A third possible issue arising is the community’s vision and concerns for the site. Tara Tran identified that the community was worried and hesitant about residential development going in as they believe that it will be low income residences and will be unsafe (Tran, 2016). The site is an important part of the city’s long term growth plan though which will likely involve residential development (Tran, 2016). This represents an opportunity however for the city to work with a developer and the community to plan a unique multi use development that benefits the community and helps the city meet its growth plan requirements.

4.6 Summary

The Greenwich- Mohawk site and Brantford’s response to it is an example of how brownfield policy in Ontario is lacking when it comes to large-scale sites. Brantford’s attempts in the beginning to attract a developer with incentives, as is done with small-scale sites, was doomed to fail due to the sites more complex barriers to development. This was however Brantford’s only real choice at that time as they could not afford to properly study the site in order to understand the range of barriers to the sites developments. Ontario’s brownfield policies
are limited to the single option of offering tax based incentives and do not fully appreciate the
difficulties involved in large-scale brownfields (Tran, 2016). The eventual municipality led
remediation of the site was due in part to contributions from the provincial and federal which
were only provided due to the efforts of councillor Marguerite Ceschi-Smith and not through an
established policy meaning that other municipalities struggling with large-scale brownfields may
not receive the funding they desperately need.

5.0 Policy Analysis

5.1 Introduction

In order to reduce the barriers to brownfield development Ontario has updated its
brownfield policies, first in 2001 then again in 2007. In 2001 Ontario passed the Brownfield
Statute Law Amendment Act, 2001 which made changes to several different provincial statutes in
order to provide clearer site assessment and remediation requirements to encourage more
brownfield development (ECO, 2008). Once completed Ontario had a legislated set of
procedures to how contaminated sites should be assessed, remediated and managed in the future
(Fishlock, 2010). In 2007 Bill 187 further reformed brownfield legislation specifically focused
on liability issues. Gradually Ontario has been updating its brownfield policy trying to find the
balance between good environmental policy and a reduction in the barriers preventing
brownfield development and while this balance is getting closer it has not yet been reached.

Ontario introduced the first stage of its new smart growth initiative in 2005 with the
passing of the Places to Grow. This act gave the Ministry of Municipal Affairs and Housing
(MMAH) authority to make decisions about growth specifically where and when it will occur by
creating growth plans. Under Places to Grow MMAH released the Growth Plan for the Greater Golden Horseshoe (GPGGH) which set aggressive growth intensification targets and severely limited the amount of greenfield development that would be permitted. This puts an even greater focus on municipalities to develop their urban brownfields in order to comply with the intensification targets. In Ontario’s Provincial Policy Statement (PPS) it identifies brownfields as important settlement areas which it dictates “shall be the focus of growth and development” and the GPGGH identifies brownfields as key intensification areas (MMAH, 2014, MOI, 2006). In many cases the development of brownfields has become essential in order to be able to meet the intensification targets but the province has not updated its brownfield policies to facilitate municipalities to meet these requirements.

The various changes over the past 14 years have left a series of brownfield policies that, while they can operate together, do not represent an efficient system to promote brownfield development while maintaining environmental standards. This analysis will summarize the 4 main sources of brownfield policy in Ontario which are:

- Environmental Protection Act
- Municipal Act
- Places to Grow Act
- Growth Plan for the Greater Golden Horseshoe

This report will analyze how these policies combine to form Ontario’s current brownfield development system. Next will be an analysis of the limitations inherent in Ontario’s brownfield
development policy. Lastly will be a set of recommendations that MMAH can make to Ontario’s brownfield policy more accessible and better able to attract developers and renew economic growth in Ontario.

5.2.0 Ontario’s Policies surrounding Brownfield Development

5.2.1 Ontario Environmental Protection Act

Before a property is developed the Ontario Environmental Protection Act (EPA) dictates in Part XV.1 that a record of site condition must be submitted to the environmental registry before development commences. A record of site condition contains several parts including a description of the property, the type of development to be built and a description of any remediation work done on the property. The most important part of the record of site condition however, especially when dealing with brownfields, is the requirement that a property undergoes a Phase 2 Site Assessment, which is “an assessment of the property… to determine the location and concentration of one or more contaminants in the land or water on, or under the property”. The site assessment must be done by a qualified person and in order to be filed with a record of site condition it must show that the contaminants on the property meet the concentrations standards set out in the EPA, 2007, c. 7, Sched. 13, s. 4 (2). Once a property meets these standards and a record of site condition certified by a qualified person is filed with the environmental registry development can begin on a property.

The process of filing a record of site condition is the regulatory backbone of brownfield development in Ontario. The standards set out by the EPA ensure that remediation of brownfield properties greatly reduce the risks of both environmental damage and public health issues. These
standards, and the remediation needed to meet, them shape the entire development process of brownfields. While it is possible to estimate the types of contamination issues that could be present in a property based on the historical uses of the property, before a property has undergone a site assessment, it is impossible to know the severity of the environmental degradation and contamination. Purchasing previously developed land can therefore pose a tremendous amount of risk to potential developers as they could end up liable for a substantial environmental remediation bill.

5.2.2 The Municipal Act

Due the risks involved in brownfield development in most cases municipalities need to offer incentives in order to attract a developer in order to compensate them for the adopting those risk. The 2001 reforms contained in the Brownfield Statue Law Amendment Act made changes to the Municipal Act to allow municipalities to provide incentives through the reduction or cancellation of taxes levied for municipal or school purposes in Sec. 365.1. A municipality may issue by-laws removing the tax on a property for the duration “of the rehabilitation period for a specified property, the development period for a specified property, or both.” In order for municipalities and developers to take advantage of this planning tool the municipality must have an active Community Improvement Plan (CIP) in place and a property owner must apply to the city to receive tax assistance.

Tax assistance can be a significant boon for developers and an efficient way to reduce the risks and costs involved in brownfield development. It is also a relatively low cost to municipalities because they, for the most part, owned the brownfield in the first place and were
therefore not accumulating taxes on it anyways. Many brownfields fall into municipal ownership due to either the past owners going bankrupt or from municipal forfeiture from not paying taxes. Brownfields are thus detrimental to municipalities occupying key development space and by reducing municipal income. Municipalities thus have a lot to benefit from the development of brownfields and why offering incentives makes sense for municipalities.

5.2.3 Places to Grow Act

The 2005 Provincial Policy Statement announced a drastic change to how planning is carried out in Ontario. The province hinted that they would be taking a direct interest in how growth would occur throughout the province with the focus of managing and directing land use by creating settlement areas and instituting minimum targets for intensification (MMAH, 2005). Later in 2005 the Places to Grow Act was passed giving the province the authority to enact the policies which they introduced in the PPS. Under this act the province is able to create a growth plan for a specific area. A growth plan can be a very broad document that can include:

(a) population projections and allocations;
(b) an assessment and identification of priority growth areas, emerging growth areas and future growth areas, over specified time periods;
(c) growth strategies for all or part of the growth plan area;
(d) policies, goals and criteria in relation to,
   (i) intensification and density,
   (ii) land supply for residential, employment and other uses,
   (iii) expansions and amendments to the boundaries of areas of settlement,
   (iv) the location of industry and commerce,
(v) the protection of sensitive and significant lands, including agricultural lands, and water resources,

(vi) non-renewable resources,

(vii) the conservation of energy,

(viii) infrastructure development and the location of infrastructure and institutions,

(ix) transportation planning,

(x) municipal waste management planning,

(xi) the co-ordination of planning and development among municipalities,

(xii) growth-related capital spending and financing,

(xiii) affordable housing,

(xiv) community design,

(xv) specified actions to be taken by municipalities to implement or achieve the policies or goals;

(e) such other policies, goals or matters that the Minister considers advisable. 2005, c. 13, s. 6.

Under these provisions the Ministry of Infrastructure (MoI) can prescribe regulations to all aspects of what was traditionally municipal planning. Of particular importance to brownfield development policy is the population projections and allocations, intensification and density, land supply for residential, employment and other uses, and amendments to the boundaries of areas of settlement. These aspects of growth plans will be discussed more in the next section on the GPGGH. The greatest impact of the Places to Grow Act is that it was a complete reversal of past development policies. Prior to the act, for the most part, development and planning fell under the responsibility of the municipalities. After this act the province had the mandate to direct growth how they saw fit.
5.2.4 Growth Plan for the Greater Golden Horseshoe

Released in 2006, the GPGGH is the most significant application of the Places to Grow Act. The purpose of the growth plan is to “ensure the development of healthy, safe balanced communities,… the revitalization of urban growth centres,… better use of land and infrastructure,… providing opportunities for businesses to locate in the Greater Golden Horseshoe,… building strong rural communities,… [culminating] in building complete communities” in one of the fastest growing regions in North America (MoI, 2006). Section 2.2 of the growth plan contains the important implications for brownfield development policy.

The growth plan sets mandatory specific growth targets for every major urban centre while drastically limiting the amount of greenfield area cities could expand onto. The growth plan also sets intensification targets for urban centres, these targets focus on both development intensity and combined residential and job density. Section 2.2.3.1 established that “40 percent of all residential development occurring annually within each upper tier and single tier municipalities will be within the built-up area” as a minimum target (MoI, 2006). Section 2.2.4 sets required combined residential and job density targets in the urban centres that range from 400 resident and jobs per hectare in Toronto to 200 in mid-size cities and 150 in small cities, these targets must be reached by 2031 (MoI, 2006). The map below demonstrates the designated urban growth centres (in light purple) as well as the limited designated permitted greenfield development (Fig: 9) (MoI, 2006). The combination of these two policies puts new requirements on municipalities to develop their brownfields in order to meet the intensification and density targets set out in the growth plan.
Fig 9: Map of the Greater Golden Horseshoe detailing the urban growth centres, already built-up area and designated greenfield growth areas (MoI, 2006).
5.3 Brownfield Policies in the United States

The trends of de-industrialization and suburbanization, discussed in Section 2, beginning in the 1970’s had a strong impact on the northeastern industrialized states in what has become known as the Rust Belt. The Rust Belt stretches through Illinois, Indiana, Ohio, Michigan, West Virginia, Pennsylvania and New York. The closure of large industrial facilities across the Rust Belt has left large, highly contaminated brownfields throughout the region. The propensity of brownfield sites has however sparked a greater involvement of the U.S. federal government in developing brownfield policies.

The US EPA oversees the federal brownfield policies and programs. In 1980 the U.S. congress signed the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), more commonly called the Superfund. The principle of the Superfund was to implement a new tax on Chemical and Petroleum industries and to use that revenue to “address the nation’s worst abandoned” and contaminated sites that pose a threat to human or environmental health (Daley and Layton, 2004). Its creation was in response to the rise in highly contaminated sites and the recognition that these sites have complex systems of contamination affecting soil, groundwater and air quality (Daley and Layton, 2004). The Superfund implemented new liabilities for responsible parties when they can be identified (US EPA, 2015). Superfund operates through actions into two categories, short term removal when contamination from a site is likely to spread and immediate action is needed, and long term remediation which “permanently and significantly reduces the dangers associated” with the spread of contamination (US EPA, 2015). The US EPA also has many different funding opportunities and grant programs to assist municipalities, communities and states with brownfield development (US EPA, 2016).
For example the Cleveland Opportunity Corridor was part the EPA’s Area-Wide Pilot Program, a program designed to aide municipalities that have experienced area wide disinvestment from large-scale brownfield sites. The US EPA has 7 grant programs for various stages of a brownfields redevelopment process (US EPA, 2016). These programs provide support to municipalities who wish to understand and plan their brownfield issues and allow a greater range of developers to invest and redevelop brownfield sites.

5.4 Limitations of Ontario’s Brownfield Development Policy

Ontario’s reforms to its brownfield policies in 2001 and 2007 have made reductions to the barriers of brownfield development however there are still some key limitations inherent in these policies. Significant improvements were made to regulatory liability issues in the 2007 Bill 187 reforms including limiting the instances that a submitted record of site development could be re-opened (ECO, 2008). There are still issues of civil liability involving the migration of contaminants, nuisance and negligence, issues that can arise even after remediating a property and filing a record of site condition (Antonowicz, 2011). Civil liability issues pose risks that have been described as “infinite as to quantum and time” meaning that the risks can arise and are prevalent even after remediation and development have occurred (Antonowicz, 2011). These liability uncertainties do not only prevent interest from possible developers but also from financiers. Banks, trust companies, pension funds and other third party investors are extremely hesitant to invest in brownfield projects due to their uncertainties and risks, whether real or just perceived. This limits brownfield developments to only those developers who are able to self-finance a brownfield development which severely limits not only the amount of developments that are undertaken but also limits these developments to relatively small brownfields.
The Places to Grow Act and the GPGGH made major changes to the process of municipal planning in Ontario. Placing new regulations on municipalities places a new requirement for municipalities to develop their brownfields at a much higher rate in order to meet the intensification and density targets set out in the growth plan. Apart from some small differences in the density targets between the growth centres, density targets are applied generically across the board and do not take into account the different realities of growth and development in each of these centres. Instead the province leaves the cities to figure out how they can meet the requirements. Cities are not faced with the same issues though, and that includes brownfields. Brownfield issues in the municipalities of the Greater Golden Horseshoe vary in their size and magnitude depending on the cities past industrial activities and economic and social circumstances. Cities such as Brantford, Hamilton and St. Catherines have a much higher propensity of brownfields due to their history of industrial activity and due to many of those industries moving or going bankrupt in the past 30 years. Some cities will therefore have an easier time meeting the regulation requirements in the growth plan because they either have less brownfields that require development or that their brownfields had less impactful uses in the past and thus it is easier to attract developers.

5.5 Recommended Policy Changes

Due to the limitations described above there are several recommendations that I would present to the MMAH in order to: 1. promote brownfield development and 2. remediate serious and large scale brownfield sites.
1. There are two key issues that are hindering brownfield development in Ontario: the lack of tools that municipalities can use in order to attract developers and reduced funding from third party sources. Since the growth plans put new pressures on municipalities to develop their brownfields it is also necessary that the province provide them with additional tools in order to attract developers. The most feasible method would be to allow developers greater opportunities to apply for tax exemptions for sites that require lengthy remediation due to serious or re-occurring contamination issues. This would provide greater security for developers who are trying perform remediation, but require greater resources to address the contamination issues on their property. It would also reduce the risk to developers that they might be mired down in unforeseen environmental issues after purchasing a property. The lack of third party funding towards brownfield development greatly limits the type of developers that can perform development which reduces the opportunities that brownfields will be developed. The province should set up a loan system for developers interested in brownfield development. This would both increase the opportunity for development and increase revenue through interest payments.

2. The current model of developer driven remediation is an efficient system when dealing with small-scale and relatively benign brownfields. However in cases of large scale brownfields or with brownfields with serious contamination due to intense industrial activity, relying on the interest of developers, even with the provision of tax incentives could be futile. Many of these more serious brownfield sites require government intervention to perform remediation in order for them to be attractive for developers.
Brantford for example could not garner the interest of developers and had to remediate the Greenwich- Mohawk site. The city only received support from the provincial and federal governments on a special case basis due to the extensive efforts and lobbying of one of the city’s councillors. Without this aide the remediation of the site would never have been possible which is why the city should not have had to fight so hard for it. The Ministry of the Environment and Climate Change should have funding which would be available for municipalities to apply for provincial aid, in funding and expertise, in order to remediate their large and heavily contaminated brownfield sites. Large scale sites can plague an entire city by being a scar on the city scape discouraging other economic development projects. While the costs of cleaning up these sites may be large they provide a variety of benefits both environmentally and economically by cleaning up contamination and encouraging development. The provincial goals contained in the Places to Grow Act and the growth plan outline the importance of brownfield development, but these goals are in many cases not achievable without government intervention.

6.0 Conclusion

Ontario’s brownfield policies do not properly address the realities of large-scale brownfield development. Large-scale projects inherently have more barriers to their development than smaller sites. These sites, and their individual barriers, can vary widely which is why they need to be properly studied. Large-scale sites often have a strong effect on their host municipality which is why they need support, both in expertise and financially, from higher levels of government. These two aspects may not necessarily be enough requiring an innovative
practice to spark interest and development in the site. Brantford struggled getting the Greenwich-Mohawk site developed because Ontario’s brownfield policies did not represent the realities of large-scale sites. The struggling city had to fight to receive support from the provincial and federal governments and they did not have the resources to properly study and plan the site in order to address its barriers to development. With the mandates in the Places to Grow Act and the Growth Plan for the Greater Golden Horseshoe for municipalities to densify and develop their brownfields the government needs to provide new tools for municipalities to accomplish these goals and provide greater support to municipalities struggling with large-scale brownfields.
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