

**SUSTAINABILITY AND ADAPTIVE REUSE: A CASE STUDY OF HISTORICAL
AND HERITAGE INDUSTRIAL SITES IN PETERBOROUGH, ONTARIO**

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ABSTRACT

SUSTAINABILITY AND ADAPTIVE REUSE: A CASE STUDY OF HISTORICAL AND HERITAGE INDUSTRIAL SITES IN PETERBOROUGH, ONTARIO

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The study examines the adaptive reuse of historical and heritage industrial sites in Peterborough, Ontario. Industrial-heritage sites face several challenges when being subjected to adaptive reuse. These challenges are largely concerned with the contamination of sites and how industrial buildings and sites can be transformed into reusable sites. The study adopted a qualitative research design and analysis. The study addressed the research gap about nature of adaptive reuse of historic and heritage sites in Peterborough. The study primarily focused on the challenges, best practices, stakeholder initiatives, and the nature of structures in contexts of adaptive reuse in Peterborough. Based on the findings of the study, COVID-19, political will, contamination and the design of heritage and industrial buildings or sites pose a challenge to implementing adaptive reuse practices. These findings provide evidence for policymakers and decision makers on how to apply best practices to adaptive reuse and cultural heritage.

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INTRODUCTION

1.1 Background and Context of the Study

Adaptive reuse is a sustainable and ecologically friendly idea in urban planning and design that involves repurposing an existing building or structure for a use other than its original intended use. Adaptive reuse can be applied to a wide variety of facilities, including factories, warehouses, and churches. has become central to the conservation and preservation of heritage and historic buildings. One of the goals of adaptive reuse of industrial and historic sites is retaining the social or cultural significance of these sites. This study builds on the adaptive reuse literature on how to uniquely develop and maintain buildings and sites (Vecchio and Arku, 2020) to examine adaptive reuse of historic and heritage industrial sites against the backdrop of making a contribution to sustainability.

One of the central norms in sustainability studies is the desire to ensure that old structures, or buildings, are subject to recycling or reuse. This has been the goal of most governments and global institutions; for instance, the European Commission has committed to the objective conservation and preservation of old structures with its policy on the understanding of the historic built environment (Veldpaus, 2023; Merai et al., 2023; European Commission, 2021). Heritage policies have an impact on any given economy since heritage on its own is made up of socio-political elements that help in planning and can aid in favourable changes in an entire economy (Veldpaus et al., 2023, Merai et al., 2022; Nadin et al., 2021).

Heritage buildings and old structures in general help connect communities with their past. Individuals are able to find a common ground for connection, usually based on how their cultures are connected to such old structures (Aigwi et al., 2018). The desire to continue finding and exploring this connection motivates stakeholders like the general public and governmental institutions responsible for heritage and historical aspects of the community and nationwide to implement effective adaptive reuse programs in order to retain and conserve these heritage and

historical buildings or sites (Dawson, 2022). According to Dawson (2022), there is a need for improved conservation and protection of heritage and industrial sites, especially given that historic buildings have social meaning and use, and significance to communities (Adams et al., 2014). Adaptive reuse contributes to sustainable development as a result of the reduction in waste. This preservation and conservation of resources or buildings helps increase the lifespan of heritage (Pintossi et al., 2023). The physical significance of heritage and historic buildings requires proper management. The proper management of heritage and historic sites or buildings will lead to tourism and economic benefits that contribute to sustainable development (Adams et al., 2014). This chapter further provides an assessment of the nature of adaptive reuse, its contribution to sustainability, challenges and advantages, Pintossi et al. (2023), using three cities as a case study (Amsterdam, Rijeka and Salerno) showed that adaptive reuse is faced with challenges such as the lack of awareness of adaptive reuse and its benefits, and compliance with regulations and policies.

The process of adaptive reuse demands that stakeholders such as communities, private and public investors are involved at every stage of decision making. It becomes a challenge to adequately involve all key stakeholders in decision making (Elsorady, 2020). Industrial-heritage reuse, which covers the repurposing of industrial heritage sites into a new program or use, aids governments and institutions to create an avenue for commercially oriented artists. The industrial sites serve as a space for the activities of these artists, who, through their works, make important contributions to conserving the culture of their communities (Chen et al., 2016).

It has been observed that industrial-heritage sites face several challenges when being subjected to adaptive reuse. This is largely concerned with the contamination of sites and how industrial buildings and sites can be easily transformed into reusable sites, unlike how old residential buildings could be easily repurposed to serve residential purposes. This study will

fill a knowledge gap where historic and industrial sites are at the center of analysis in order to contribute to the literature on adaptive reuse (Pintossi et al., 2023; Chen et al., 2016).

Peterborough, Ontario, Canada has industrial sites that can be reused; however, unlike residential sites, there is an issue of contamination that needs to be considered in the repurposing program. Understanding how adaptive reuse is carried out within such a provision of contamination remains one of the knowledge gaps that this study seeks to address. The study uses Peterborough, as a scope in order to address the identified research question and its accompanying research objectives. Peterborough presents a good and unique case in examining the adaptive reuse of historic and historic sites.

Peterborough is located on the treaty and traditional territory of the Michi Saagiig Anishinaabeg, in the territory covered by the Williams Treaty (Trent University, 2023). Through the treaties and land claims processes, Hiawatha First Nation, Curve Lake First Nation, Alderville First Nation, and the Mississaugas of Scugog First Nation have been established in the Peterborough area: people who were here “before, during, and after the settlement and colonization of Nogojiwanong” (Peterborough) (Migizi and Kapyrka, 2015). The Indigenous people have supported initiatives that promotes the preservation heritage and historic sites for instance cultural activities and educational activities (Trent University, 2023; KWIC, 2021). Migizi and Kapyrka (2015) noted that Indigenous people, for instance, those around Mississauga's homelands, entered into several political agreements with the government. Although these political agreements weren't implemented, they exhibit how various Indigenous people were ready to contribute to preserving their heritage (Migizi and Kapyrka, 2016; Migizi and Kapyrka, 2015).

1.2 Research Question

The research question for this study is:

1. What is the nature of adaptive reuse of historic and heritage industrial sites in Peterborough?

1.3 Research Objectives

The objectives of this study are:

1. Identifying the challenges involved in reusing old structures in Peterborough.
2. Identifying best practices for repurposing abandoned building.
3. Examining the initiatives of various stakeholders including public and private entities, aimed at restoring abandoned heritage structures.
4. Identifying the nature and kinds of structures being reused

1.4 Concluding Remarks

This research builds on other studies in the literature to further examine the idea of adaptive reuse and how the adaptive reuse contributes to the conservation and preservation of heritage and historic structures. The fundamental goal of programs for adaptive reuse is to preserve the social or cultural relevance of these locations. The chapter also emphasized the relationship between sustainability and adaptive reuse, stressing the contribution that adaptive reuse can provide to sustainable development. This chapter provided the groundwork for the future analysis and research findings by defining the study's background and goals.

Participation from stakeholders is essential to the adaptive reuse process because it guarantees that the varied requirements and interests of different people and groups are taken into account. Stakeholder participation is much more complicated when it comes to industrial and historic sites. Cultural and legacy values are frequently present at historic locations, and possible pollution at industrial sites may raise environmental concerns.

Furthermore, when it comes to adaptive reuse, polluted industrial sites pose special difficulties. To maintain the safety and wellbeing of current users as well as the environment, it is necessary to plan carefully and take remediation measures when pollutants and dangerous chemicals are present. Reusing hazardous areas, however, can also offer chances for revival and sustainable rebuilding.

Despite the importance of polluted industrial sites in the process of adaptive reuse, there is a research gap in identifying challenges in recognizing and resolving this problem. The purpose of this chapter was to draw attention to the need for more study and to offer suggestions for how polluted industrial sites might be managed in the context of adaptive reuse.

The city of Peterborough, Ontario, was employed as a case study to accomplish these research goals. With a long industrial history, Peterborough has several polluted sites that have been effectively used for a variety of projects. This chapter will contribute to bridging the research vacuum and provide helpful insights for practitioners and policymakers involved in adaptive reuse initiatives by examining the parties involved, the difficulties encountered, and the benefits which includes the preservation and conservation of heritage in Peterborough.

LITERATURE REVIEW

2.1 Introduction

This section provides an overview of the theoretical and empirical review of studies related to the adaptive reuse of historical and heritage structures. It provides an in-depth assessment of themes (maintaining of historical structures, issues and challenges of adaptive reuse of historical structures) in the field of adaptive reuse-related to the best practices, and strategies used in restoring abandoned structures. While also reviewing the challenges stakeholders face conducting the entire process of adaptive reuse, integration of ruins and regeneration of historical sites. The chapter provides assessment of the literature how industrial and historical sites in contemporary cities are being developed to achieve sustainability goals. It also explained the challenges connected with executing adaptive reuses program which has been summarized under COVID-19 pandemic and the lack of political interest, engagement and design, financing and economic challenges and regulatory challenges.

The desire to carry on with any adaptive reuse project comes with the need to seek funding, among other necessary resources. With the lack of political will, planners and architects may face a problem linked to the lack of motivation from these policymakers (Bullen and Love, 2009) affecting the flow of vital information, funding in addition to the nature of the regulatory environment that could have provided the needed support. More recently, scholars like Arfa et al., (2022) explaining how the COVID-19 pandemic has had an influence on adaptive reuse projects. The pandemic made it mandatory to reassess the overall plan for projects as there was a shift in governmental focus in addition to the restrictions that ultimately affected carrying out work-related tasks (Mısırlısoy and Günçe, 2016; Mohamed et al., 2017; İkiz Kaya, Pintossi and Dane, 2021). This study contributes to literature by providing a scope (Peterborough) with a balanced interest from government and organizations in-charge of repurposing historical and heritage sites. The section on urban regeneration and adaptive reuse

examined related works on developing historical and heritage sites in contemporary cities. The issues and challenges related to adaptive reuse of historical structures are also reviewed, including issues such as the lack of political will and the COVID-19 pandemic. The last section provided evidence of empirical studies related to the adaptive reuse of historical structures.

2.2 Urban Regeneration and Adaptive Reuse: Maintaining of Historical Structures

This section provides a review of literature on developing contemporary cities and adaptive reuse in the context of sustainability. It relies on the relevant information within this context to explain the usefulness of developing cities under urban regeneration and adaptive reuse.

2.2.1 Developing Contemporary Cities

In the context of developing cities (Chen, Chiu and Tsai, 2018; Hettema and Egberts, 2019; The World Bank, 2023b), it is common to find the reuse of old settings, an approach that recognizes a repurposing of old structures as both an economic and social obligation. In order to achieve the plethora of benefits that comes with repurposing and implementation of an ethically-based approach to this objective tends to tackle the imperfections of neoliberal urbanism, hence seeking the overall benefits of the society at large (Manganelli, Tataranna and Pontrandolfi, 2020). While this may seem optimal, the structural upgrade of historical and heritage buildings may or may not be regarded as ruins as objects of value worthy of an investment (Celadyn, 2019; Manganelli, Tataranna and Pontrandolfi, 2020; Dionisio and Carr, 2022; Lanz, 2023). According to Manganelli et al., (2020) historical structures or buildings designated as ruins can be saved from demolition through retrofitting and reconstruction that seeks to address various concerns and issues thus categorically achieving a desired level of

safety during their reuse. This performance is defined by Manganelli et al., (2020) as the intended objectives that reconstructed ruins will achieve.

The evaluation of structures and sites expecting repurposing is made up of buildings that suffer from materials with low quality and also poor maintenance treatment. This then makes such structures unpleasant and unaccommodating at first glance calling for the need for a more structured approach to structural regeneration that will ultimately ensure these historical and heritage buildings are well integrated into modern societies and neighborhoods. This integration comes with a new or refined usefulness for these structures clearing out ruins and achieving the overall goal of sustainability programs. These sustainability contributions include highly efficient and decarbonized building stock by 2050 (Ruiz-Pérez et al., 2019; Manganelli, Tataranna and Pontrandolfi, 2020).

A clear understanding of the process of urban regeneration which is addressing challenges in urban centers in order to improve the quality of life or living conditions (Dewiyana, Ibrahim and Hajar, 2016; Rosenbaum et al., 2021; The World Bank, 2023a) does not leave out the role and classification of stakeholders. These private and public users aid in the process of decision making where they pose several challenges to the overall program (Manganelli, Tataranna and Pontrandolfi, 2020; Shen, Yao and Wen, 2021; Carra et al., 2022; Dionisio and Carr, 2022). Dionisio and Carr (2022) identified five elements that can help communities and other stakeholders augment the integration process and reach the needed level of attachment to these structures. This integration process according to the authors is a process of "compromise" where ruins are merged with urban fabrics. The elements were identified as multi-historical memory connected to these old structures or sites; polyvocality which allows for varying inputs from individuals (stakeholders) who interact with the structures or ruins; holistic urban integration; capacity to evolve and finally the presence of a stage for the relationship between human and more-than-human. The interrelatedness of these five elements

mentioned above, leaves an unerasable mark on stakeholders, it becomes very difficult to separate the significance attachment of these structures unto the community from the historical and heritage structures.

In a defined setting, Shen et al (2021) posits that the situation in China presents a state of complexities that comes with urban regeneration noticeably coming from the activities of stakeholders. These issues largely referred to as a strategic trap in the context of Chinese urban regeneration entails property rights declared obstruse in nature, arrears in the segment of investments and most prevalent the current nature of the regulatory demands of urban planning. Unfortunately, these bottlenecks make it difficult for stakeholders in-charge of executing the transformative regeneration scheme rendering them less effective or in some cases unproductive. The challenges associated with the overall process will be given the needed attention in subsequent evaluation.

Fundamentally, urban regeneration is expected to create a new feeling of attachment from already existing structures with the community. Although this feeling of attachment may serve several purposes, the process of transforming structures may be faced by several challenges such as regulatory requirements of transforming cities, the expectations of investments and the existing nature of property rights which could decrease the power and interest of market actors (Manganelli, Tataranna and Pontrandolfi, 2020; Shen, Yao and Wen, 2021; Carra et al., 2022; Dionisio and Carr, 2022). At the core of this is the need to find a balance between cultural significance while also achieving the goal of sustainability through smart growth. The next section will seek to evaluate adaptive reuse explained within the context of this study.

2.2.2 Sustainability Evaluated Under Adaptive Reuse Strategy

As an attempt to preserve the values, community connection and the historical reference of old structures, adaptive reuse is a process meaning it can occur in different kinds, with sustainability at its core (Arfa et al., 2022). While urban regeneration could rely on demolishing (Manganelli, Tataranna and Pontrandolfi, 2020; Shen, Yao and Wen, 2021; Dionisio and Carr, 2022), adaptive reuse understands the beauty values, economic elements and cultural connections that old building carry thus the need for stakeholder like communities and investors for instance financial institution seek an appraisal that looks beyond the adaptation costs of such heritage building (Shipley, Utz and Parsons, 2006; Arfa et al., 2022). The understanding of beauty values, economic and cultural connections set the tone for a comprehensive adaption of historical and heritage structures or buildings into current period while also looking at how these structures can still be effectively useful in the future.

Furthermore, the process of transforming historical structures recognizes the interaction among people, places, and communities (Dionisio and Carr, 2022) prompting the need for an action putting together all that supports sustainability within that sphere. As in the case of adaptive reuse seeking sustainability, the process explained by Arfa et. al., (2022) notes the relevance of nine (9) steps described within the proposed model of practice: initiative, analysis of heritage buildings, value assessment, mapping level of significance, definition of design strategy, final decision-making, execution, maintenance, and the final step evaluation after years. These steps are backed by theory thus making their practice result-oriented with a reflection on achieving the underlining goal of a “change in use” that can remain relevant in the future. The steps consider the beauty values, economic and cultural elements outlined in the study by Arfa et al., (2022). These steps are identified as an adaptive reuse process for heritage buildings and need to be considered if the goal is to preserve and conserve values of heritage buildings.

2.3 Adaptive Reuse of Historical Structures: Issues and Challenges

2.3.1 COVID-19 Pandemic and the Lack of Political Will

Adaptive reuse of historic structures and heritage buildings is an important technique for achieving sustainable goals which reflects the best practices and strategies used in restoring abandoned structures. Although this may seem like the order of the day, it does not come without its own challenges in its implementation. The adaptive reuse of historical, heritage, and cultural sites, although creating multiple benefits for users, creates financial challenges and the inability to access other critical resources for the entire adaptive reuse program (Amato, Andreoli and Rovai, 2021). Although sustainability efforts are made known within local and central government's strategy to protect built heritage, Amato et al., (2021), found that that conducting a suitability study is very complex. The authors further stressed restoration costs being high, issues with management as a result of the constant need for highly skilled personnel to engage in maintenance, and also the challenge posed by political will and instability in supporting adaptive reuse projects. While these challenges may be peculiar to changing functionality of historic buildings, specifically the Former Carthusian Monastery in Tuscany, Italy, the results which are high-cost restoration and unforeseen structural problems fit within the scope of adaptive reuse in general and can therefore be considered in various settings.

While the challenges highlighted by Amato et al., (2021) are of importance to this study, the changing nature of the world due to the pandemic and other uncertainties could also contribute to the growing number of challenges within this field. It is important to note that the authors did realize how the COVID-19 pandemic has made it obligatory to make changes to expectations, especially when these historical sites, through adaptive reuse, will be considered for tourism, which in turn could be a source of generating income for self-funding. The uncertainties within the market and how the entire market could respond to these initiatives

remain huge considerations for a successful program (Amato, Andreoli and Rovai, 2021; Arfa et al., 2022). The pandemic is considered here since it can be considered as a current challenge in adaptive reuse activities of historical sites.

The implementation of adaptive reuse in major and central cities, for instance in Los Angeles (LA), aside from having an investment appeal, comes with challenges for instance inadequate funding or investment should adaptive reuse lack government or political will. This is due to the level of incentives that the government and other major players, both private and public, are expected to provide in exchange for a "no demolition" deal for the caretakers or owners of such spaces (Bullen and Love, 2009). This study shows how geographic location is important in adaptive reuse and thus, despite certain prevailing challenges like funding, governments and other institutions make themselves available to facilitate adaptive reuse due to their interests within that geographical zone. The advantages can then be linked to the benefits that come with the location or geographical zone of such historical, industrial, and cultural spaces.

Within the same context of reusing historic cultural spaces, Lynch and LeDrew (2020) examined how the adaptive reuse of notable worship spaces in Newfoundland fits into the objective of aiding social enterprise and providing community services. The study focused primarily on the historic church in the City of St. John and assessed how adaptive reuse achieved results beyond secular objectives. While adaptive reuse of certain historic and cultural spaces provides new life for buildings, functionality needs to be critically assessed, especially if those spaces previously served secular functions (Amato, Andreoli and Rovai, 2021; Lynch and LeDrew, 2022). While the experience of reusing these spaces faces huge challenges, it should be noted that decision-making in this regard is complex as extensive stakeholder efforts seek to reimagine new functions that fit historic and cultural spaces.

2.3.2 Engagement and Design

According to Pintossi et al., (2021), due to the various levels of engaging users (multilevel stakeholder engagement processes) that come with adaptive reuse of cultural and historical sites, decision making becomes difficult. The difficulty in decision making comes as a result of three main considerations: stakeholders' (example users, communities) knowledge of the entire process or initiative, stakeholders' interest in the overall program, and civic engagement that is public engagement where the public is also considered a stakeholder. The challenges in reuse based in City of Amsterdam highlight challenges with design and technical aspects and with compliance with codes and regulations (Bullen and Love, 2009; Pintossi, Ikiz Kaya and Pereira Roders, 2021b).

Additionally, architects and planners are faced with issues concerned with deciding on the best "reuse function" that will preserve the values of the heritage and historic space or buildings (Arfa et al., 2022). This consideration is needed to ensure the appropriateness of the design in addition to preserving the cultural identity of such buildings or sites. While scholars have proposed several frameworks for identifying functions and designs, they are faced with the varied natures and ambitions of multiple stakeholders (Bullen and Love, 2009; Amato, Andreoli and Rovai, 2021). The adaptive reuse process demands that, stakeholders constantly engage in the decision-making process, even if there is no strategy or guideline. Stakeholders are expected to reach a consensus, which could be time-consuming, ineffective in terms of cost, and sometimes affect the overall execution plan (Manganelli, Tataranna and Pontrandolfi, 2020; Amato, Andreoli and Rovai, 2021; Arfa et al., 2022).

Designers are also expected to consider the prevailing regulatory requirements (Mısırlısoy and Günçe, 2016). Adaptive reuse requires that actors be fully involved in the entire decision-making process since established norms and regulations need to be followed in order to preserve the historic, cultural, and overall significance of the selected sites and spaces. The

newly proposed functions are expected to be subjected to an entire vetting process that looks at the level of continuity in design, how new layers could augment the space, in addition to the satisfaction stakeholder could get. Satisfying stakeholders even becomes more complex when dealing with a multi-stakeholder framework that needs to be consulted for effective decision-making (Mısırlısoy and Günçe, 2016; Dionisio and Carr, 2022). The challenges faced by designers are worsened in the situation where the determination of new functions for the identified sites for reuse is taken randomly without the necessary consultation among stakeholders or interested parties. Thus, decision making without holistic involvement and the adoption of a strategic and systematic approach would continue to challenge the success of adaptive reuse projects. The lack of a clear methodology for the initiation and completion of reuse projects will lead to failure in achieving the economic, social, and sustainable objectives of the entire process.

Adaptive reuse remains one of the most effective ways of retaining cultural sites and heritage buildings for all generations (Yazdani Mehr, 2019; Ikiz Kaya, Pintossi and Dane, 2021). The decision to transform these sites or spaces, usually from value-based to technological and user-based needs and demands, usually requires a higher level of engagement. This poses several challenges, as there may already be guidelines and policies meant for the further development of these sites. This calls for the restructuring of the entire multi-stakeholder framework meant for the restoration and conservation of reusable heritage and cultural sites or buildings (Yazdani Mehr, 2019).

Adaptive reuse projects are expected to face diverse opinions with their multiple stakeholder engagements. Both public and private stakeholders usually have their individual objectives, and it is expected that they come to terms and agreement on several elements. While decision-making could be delayed as a result of this, the nature, quality, and level of decay of heritage and cultural spaces or buildings could affect the success of the entire project. The more

decayed the historical buildings are, the more difficult it will be to carry out the project. This being said, stakeholders are expected to have enough funding from various sources to take care of costs related to maintenance and keeping the various departments within the project functional. It is worth noting that when mapping knowledge does not integrate with overall urban planning knowledge, the success of the project in general is affected (Ikiz Kaya, Pintossi and Dane, 2021; Pintossi, Ikiz Kaya and Pereira Roders, 2021a; 2021b).

Using Gropius Torton Estate, Dessau, as a case study, Ahmed et al., (2020) identified the objective of maintaining originality as a main challenge when it comes to adaptive reuse. This challenge was primarily due to a lack of public awareness similar to the knowledge-related challenges identified in the study by Pintossi et al., (2021a). According to Ahmed et al., (2020) collective memory served as the main tool in analyzing techniques in conservation that could be adopted. The term collective memory illustrates how individuals share certain cultural and historical elements together, further serving as a bond among them. The implementation of any strategy that seeks to achieve conservation is built on the shared and collective values of individuals, which in turn are attached to heritage and cultural spaces. Hence, there is always a time-consuming deliberation about how to achieve contemporary design goals while also maintaining authenticity and originality (Yazdani Mehr, 2019; Ahmed, Ghalam and Moghaddam, 2020). Despite the shared memory facilitating conservation of values and heritage, the adopted standard of building, which is relatively low, in addition to the poor insulation of buildings, will undermine any objective of easily carrying out adaptive reuse.

Several studies have shown how adaptive reuse supports development and sustainability (Pintossi, Ikiz Kaya and Pereira Roders, 2021a; 2021b). This central role played by adaptive reuse makes it prone to several bottlenecks, which according to Naima (2021), could be associated with the type of ownership of identified sites or the percentage of ownership between private individuals and the public or government, how the heritage

protection policy of an area is structured, the state of targeted sites, especially when they can be classified as vernacular and in addition, the desired originality of the final product (new construction) given that most heritage sites are considered traditional (Amato, Andreoli and Rovai, 2021; Naima, 2021; Pintossi, Ikiz Kaya and Pereira Roders, 2021a). The study focused on Oman and indicated how built heritage management is also faced with the challenges of dealing with multiple stakeholders, for instance local government, national government, investors, the local community, and scholars in academia.

The difficulty in stakeholder engagement further leads to making a decision regarding blending contemporary layers with already existing layers or designs. Different stakeholders may have their own independent opinions in relation to how to maintain originality and authenticity. The challenge of design continuity coupled with the determination of new functions underscores the challenges of modern-day designers in addition to other stakeholders (Mısırlısoy and Günçe, 2016; Naima, 2021; Dionisio and Carr, 2022).

2.3.3 Financing, Economic and Regulatory Challenges

According to Mohamed et al., (2017) the prevailing economic condition further places restraint on achieving the goals of adaptive reuse projects. In this regard, the economic stress of even one project among several could affect the timeline of reuse, taking into consideration several constraints (Mohamed et al., 2017). Sustainability and reuse projects in general demand the availability of economic resources, so any form of inadequacy could contribute to failure, causing displeasure for both private and public actors. Designers and planners, aside from all the dedication they could have, would need access to funds and other resources to execute their functions, and this is the same for several stakeholders who are primarily dependent on market conditions (Mısırlısoy and Günçe, 2016; Mohamed et al., 2017).

Investors who are also stakeholders are usually conditioned to receive returns on the funds they put into such projects. With tourism being one of the uses of repurposed historical sites or heritage spaces, a location that could attract "business" will be much preferred. Government and other regulatory institutions or bodies will also need a good reason to support the decision to engage in adaptive reuse rather than demolition. An identified space for an adaptive reuse project that is located within a modernized area or architectural layout will mean ensuring a balance between contemporary and historical layouts.

Since the goal is to maintain a level of attachment to these buildings, selecting a new function to satisfy multiple users becomes a problem, as one function may not be able to meet the expectations of multiple stakeholders in most cases. The financial appeal of historical spaces also makes it difficult to decide which function could assist with return on investment and also self-financing maintenance activities (Amato, Andreoli and Rovai, 2021; Arfa et al., 2022).

In some cases, as pointed out by Bullen and Love (2009), the regulatory framework for conducting adaptive reuse remains slightly against a full-scale retention of commercial or industrial buildings, as they have been linked to slowing the regeneration efforts of major cities. It remains an issue when there are no laid-out plans to implement strategies that allow both adaptive reuse and regeneration to separately execute their functions (Bullen and Love, 2009; Ikiz Kaya, Pintossi and Dane, 2021; Pintossi, Ikiz Kaya and Pereira Roders, 2021b).

The study by Ikiz Kaya et al., (2021) highlighted the relevance of adaptive reuse in an economy. According to the authors, reusing cultural heritage has the potential to stimulate economic growth, enhance inherent values, reduce material usage, and reduce energy consumption. Although it remains relevant, adaptive reuse is associated with challenges such as financial constraints, limitations of regulatory frameworks (such as European, national and local), and a poor level of engagement when it comes to decision-making. Adaptive reuse

projects are very unlikely to involve only one stakeholder; hence, multiple stakeholder involvement always requires a carefully planned framework for engagement. This is done to ensure that all concerns and desires are duly considered; however, it becomes difficult to achieve such an ideal position. Financial resources that is money needed to fund adaptive reuse are always needed to allow for a successful competition of reuse projects (Misırlısoy and Günce, 2016; Mohamed et al., 2017; İkiz Kaya, Pintossi and Dane, 2021). Mostly, it is constrained as a result of the lack of political will or inability of both public and private parties to fully fund the project. Policy makers, who are stakeholders in almost every reuse project, have to deal with certain restrictions for instance level of funding and limitations that could affect the final results of the project.

In a more comprehensive manner to identify the challenges associated with adaptive reuse, Pintossi et al., (2021) with the use of content analysis techniques, identified participation-related, capacity-related, regulatory-related, economic-finance-related, and finally knowledge-related challenges in connection with adaptive reuse, which relied on the opinions and experiences of other sources. Thus, it is indicated that participation-related challenges spell out issues such as limited participation among stakeholders in decision-making, a lack of representation among interest groups, the level of qualification of stakeholder groups being a limitation to participation, in addition to the timing of participation (Pintossi, İkiz Kaya and Pereira Roders, 2021a). The researchers further found out that the limitations on human resources, the lack of local expertise and skilled tradesmen, and the absence of guidance on adaptive reuse matters contribute to capacity-related challenges (Pintossi, İkiz Kaya and Pereira Roders, 2021a). Regulatory-related challenges were also associated with issues regarding land management, restrictions posed by planning regulations, and complex procedures in authorising documents and accessing funds, among others (Naima, 2021; Pintossi, İkiz Kaya and Pereira Roders, 2021a).

According to Naima (2021) and Pintossi et al., (2021a), “economic-finance-related” issues were identified as major challenges, thus highlighting issues such as the lack of funding or financial resources for maintenance, conducting the adaptive reuse project itself, and building capacity among the human resources needed for the project. In the case of a poor state of heritage or cultural sites or spaces, it also creates a huge financial loss, decreasing its economic viability.

Fundamentally, the location of any heritage site affects the economic viability or investors’ appeal of the project. Certain locations, as noted by Bullen and Love (2009), entice the government and other parties to stay fully committed and interested in the project, as these locations could bring about certain returns after repurposing. This then makes accessibility to historical and cultural spaces a key factor, or perhaps a challenge that needs to be critically examined.

2.4 Empirical Studies on Adaptive Reuse of Historical Structures

The implementation of adaptive reuse policies and the execution of related projects are usually considered based on the city, or in a wider context, the geographical location. A review of selected adaptive reuse studies within Canada with a primary focus on developments within Ontario, and outside this scope are examined to enhance the level of contextual analysis.

In a study by Shipley et al., (2006) on the business of renovation in Ontario, Canada, stakeholders, especially bankers and developers, indicated that demolishing is preferred to costly adaptive reuse. This assertion generally leads to a loss of social value, even though some economic value is made since these old buildings in Ontario showcase the rich heritage of communities and the entire country in some cases. Hence, the preservation of these buildings without demolishing them will, for the long term, remain an economic resource in addition to their aesthetic and cultural components (Shipley, Utz and Parsons, 2006; Pintossi, Ikiz Kaya

and Pereira Roders, 2021a). The authors further noted that Ontario houses a group of investors who are lovers of old buildings and are ready to carry on with an expensive adaptive reuse project and wait for the returns that come with heritage development. On a much positive side, the current legislation in Ontario puts local councils' authority in a higher position of power as far as preventing demolitions of certain listed sites are concerned. This offers more room for conservation, continuity in shared and collective memory, and benefits from the business of heritage development in Ontario (Shipley, Utz and Parsons, 2006; Ahmed, Ghalam and Moghaddam, 2020).

In a study conducted in Newfoundland, Canada, Lynch and LeDrew (2020) highlighted how a number of cultural, historical, and industrial areas or sites are calling for innovative ways to put them into a reusable condition. These locations are usually old settlements that remain assets to communities and the nation at large in social, cultural, and material spheres. In order to study post-secular placemaking and adaptive reuse of worship spaces in Newfoundland, the authors established a relationship with the literature of cosmopolitanism and urban parochialism. This offered them the ability to critically examine the issues of rurality and globalization (DeVerteuil and Manley, 2017; Lynch and LeDrew, 2022). The study noted that over 9,000 religious spaces across Canada are expected to disappear in their current state within the next 10 years. This closure of over 705 religious spaces or sites is expected to affect both large and small communities in Canada. Although this seems like a challenge, old or historic religious buildings could be positioned through adaptive reuse to provide social functions in Newfoundland, ultimately aiding the development of sustainability within a contemporary city. Adaptive reuse within this context can be regarded as urban or rural, mixed-use, or as the consumption of space. The transfer of rights of use from religious bodies to secular bodies, for instance in the case of Cochrane Street United Church (CSUC) to an entity for social enterprise functions, didn't happen without several contests and conundrums (Lynch and LeDrew, 2022).

Vecchio and Arku (2020) noted that adaptive reuse presents a unique way of maintaining structures, unlike demolition and traditional brownfield redevelopment. Through adaptive reuse, heritage is preserved in addition to transitioning industrial sites into commercial or recreational spaces. Based on the current Official Plans of all 51 cities and a specific focus on Ontario, Canada, it was evident that there is a high interest in dealing with the challenges and issues that come with adaptive reuse and development. Cities within Ontario have stressed the need to enhance the adaptive reuse promotional campaign, which is expected to resolve all issues related to affordable housing, intensification revitalization in the urban core, and making spaces available for creative and vibrant industries (Vecchio and Arku, 2020). The study further illustrates how land-use policy in Ontario is linked with the city's economic development plan.

In New Zealand, studies have shown that its provincial towns are made of numerous historical buildings with no one occupying them. These buildings are designated as having a relatively higher heritage value (Aigwi, Egbelakin and Ingham, 2018). In an attempt to evaluate the efficacy of adaptive reuse rather than demolishing within the town centre of Whanganui, the authors found out that a majority of the respondents agreed to the influence of adaptive reuse as a determining factor. This was due to the ability to retain the heritage that comes with these historical buildings. With reference to the Friedman analysis, it was also made clear by Aigwi et al., (2018) that "no significant differences existed" when considering the criteria under adaptive reuse efficacy. This was based on the participants of a workshop, thus justifying their approach to the study overall. Just as in Ontario (Vecchio and Arku, 2020), the popularity of adaptive reuse is critical in addressing specific issues within the development of an area or city.

Moreover, another study conducted within Amsterdam by Pintossi et al., (2021b) looked at the challenges and solutions in connection with adaptive reuse of cultural heritage through a historic urban landscape approach. The creation of an enabled environment with

fewer regulatory restrictions and the availability of technical knowledge proves to support the overall success of adaptive reuse projects. Thus, in Regina, Saskatchewan's Warehouse District, such an enabling environment has over the years permitted the smooth conversion of post-industrial structures into lofts. The study highlighted the adoption of the loft model of gentrification in large international cities. This was backed by the current literature, as studies focusing on smaller cities have received less attention. The authors emphasized that the Warehouse District is shifting away from its industrial functional purposes and towards providing entertainment venues and artist studios. Individuals with higher income levels took advantage of this shift in the cultural identity of the space with the introduction of new designs, mostly interior, of these lofts (Mathews, 2019).

Fundamentally, adaptive reuse remains one of the areas with a lot to explore, especially with the rise in sustainability goals of institutions, locations, and national authorities. The scope of this study in Peterborough will contribute to expanding the literature on adaptive reuse since it seeks to fill a knowledge gap. The current available literature offers more insights into the objectives of this study and the overall aim. As individuals continue to seek collective memory (Ahmed, Ghalam and Moghaddam, 2020; Amato, Andreoli and Rovai, 2021) through available heritage spaces, and the government and other stakeholders exercise their authority (Naima, 2021) in preserving and conserving cultural and historic values through repurposing such sites, adaptive reuse will continue to be relevant in several considerations within the scope of sustainability and beyond.

2.5 Concluding Remarks

In conclusion, previous studies have shown how the field of adaptive reuse has developed over the past decades in relation to how historical and industrial spaces are repurposed to give them a new function. The act of putting old spaces to use was seen as both

a social and economic obligation. These benefits are necessary for achieving the minimal level of sustainable requirements that societies strive for in this era (Bottero, D'Alpaos and Oppio, 2019; Manganelli, Tataranna and Pontrandolfi, 2020; Figueiredo, Prim and Dandolini, 2022). It was also realized that historical and heritage buildings are objects of social relevance, especially to communities. The decision to repurpose historical and heritage industrial sites enhances the feeling of attachment between individuals or communities and these heritage structures or buildings. In carrying out adaptive reuse of historical and heritage sites, several challenges were identified, including issues with engagement, design, financial, and regulatory concerns. The literature review further provided empirical evidence on the adaptive reuse of historical structures. In Canada, studies show that adaptive reuse ensures the conservation of heritage and promotes collective memory (Shipley, Utz and Parsons, 2006; AlSadaty, 2018; Lak and Hakimian, 2019; Ahmed, Ghalam and Moghaddam, 2020). The evidence from previous studies helps this research to know the thematic areas to consider, particularly under challenges, in order to identify new developments using Peterborough as a case study. While previous studies have focused on heritage or historical sites that easily fit within residential usage, this study takes the literature further by evaluating the case of industrial sites. This research will then be able to provide evidence of new challenges that are not only peculiar to residential heritage or historical buildings but also to commercial or industrial spaces. Hence, there is a focus on adaptive reuse with similar or related functions, like residential. This study will expand the literature on adaptive reuse by considering the challenges involved in repurposing industrial sites for residential use.

RESEARCH METHODOLOGY

3.1 Introduction

This chapter provides an explanation on the methodology used in this research. It took a critical look at the objectives of the study and based on assessment, pairs it with the most appropriate research methods and techniques of analysis to address them. As a primary part of this chapter, there is a section dedicated to explaining the philosophical assumptions used in answering the research questions and also guiding the entire conduct of this research. The research design, the scope and area of this study and data collection methods will be clearly explained.

The researcher evaluated all the predominate research paradigms and philosophies in an attempt to select the best fit in assessing the adaptive reuse of historical and heritage industrial sites in contributing to sustainability by using Peterborough, Ontario, as a case study. The pragmatic research paradigm was used in addressing the identified research objectives and aims. The selected paradigm predetermined the considerations made under ontological, epistemological, and methodological assumptions within this study.

Further, the study employed the use of qualitative method, which allow for the use of a natural setting in gathering and analyzing data related to the research aims. This method was chosen to give a comprehensive understanding of the phenomena being researched. In relation to this, the case study approach was also adopted for this study as a result of the benefit it offers in getting well-focused research results. Peterborough was selected as the case for this study primarily based on its unique feature in relation to its extensively composed map that shows land use, offering the scope for an extensive inquiry to be conducted on the research question.

Both primary and secondary data were collected for this study through a semi-structured interview supported by already existing databases such as and academic journal articles.

3.2 Research Paradigm and Philosophy

The research paradigm provides a guide and a set of beliefs that guide the paths of a researcher as they are mainly determined or influenced by the nature of the research being conducted (Creswell, 2014). For this study, the pragmatism paradigm was chosen to guide the conduct of this study, which according to Feilzer (2010, p. 8) can be defined as a form of paradigm that “sidesteps the contentious issues of truth and reality”. Pragmatism looks at the practicality of addressing issues and matters as they evolve (Tashakkori, 2009).

According to Creswell (2014), the pragmatic research paradigm is derived from the premises of actions, situations, and consequences, indicating the relevance of being practical in assessing the worldview. This form of research paradigm emphasizes on the application of actions and all applicable approaches in dealing with the main research problem. Unlike other views, pragmatism supports multiple realities and the implementation of a mixed methods approach in conducting a study. Also, one major element in understanding pragmatism as a research paradigm is its relation to drawing inferences from fields such as social, historical, and political just to name a few. This makes it a more acceptable for different assumptions, making research under this view extremely diversified (Feilzer, 2010; Creswell, 2014).

Based on such a stance in addressing research objectives and questions, the pragmatic paradigm generally offers researchers a higher level of flexibility through the use of both qualitative and quantitative data and approaches. This methodological flexibility improves the level of inquiry and how the overall research design can adapt to the overall process of research as far as the aim or research goal is of concern (Feilzer, 2010; Creswell, 2014). With reference to the outlined research objectives, the pragmatic paradigm is ideal for examining the following with respect to the scope of the study identified:

- i. Identifying the challenges involved in reusing old structures in Peterborough;

- ii. Identifying best practices for regaining abandoned building into their usefulness;
- iii. Examining the initiatives of various stakeholders including public and private entities; aimed at restoring abandoned heritage structures;
- iv. Identifying the nature and kinds of structures being reused.

These objectives are addressed through the effective use of qualitative methods, with each for reliable results and findings. Noticeably, the pragmatic view used in examining adaptive reuse of historic and heritage industrial sites to contribute to sustainability in Peterborough makes use of a pluralistic approach in order to tackle the research problem through properly sourced knowledge (Feilzer, 2010; Teddlie and Tashakkori, 2010; Creswell, 2014). This continues to explain the considerations made under the following terms: ontology, epistemology, and methodology.

3.2.1 Ontology

Ontological underpinning relates to how reality is viewed, perception of being and nature of existence. In the case of a pragmatic paradigm, its ontological consideration is “reality” where ideas and contributions are relatively practical in nature and have a direct impact on the interpretation of the truth (Denzin and Lincoln, 2011; Lincoln, Lynham and Guba, 2011; Creswell, 2014). This supports the study’s aim of getting a true representation of events through responses gathered from events that exist in reality which is further supported by the mixed methods approach. Various sources will provide relevant information and insights thereby giving a full view of reality that relates to the research problem.

3.2.2 Epistemology

In relation to epistemology, it puts researchers at the centre of defining knowledge that is acceptable within their field of study. Within pragmatism, knowledge is constructed through a series of experiences and reasoning. It has been argued that experience leads to behaviour within which can also be a factor in describing and defining what knowledge can be. Thus, our behaviour is an explanatory element for knowledge. Epistemology has then been simply explained as “how we know what we know” (Teddlie and Tashakkori, 2010; Creswell, 2014). The study makes use of this assertion through the collection of both quantitative and qualitative data and analysis techniques on the foundation of a pragmatic research methodology seeks knowledge, thereby using the knowledge gathered to examine the adaptive use of historic and industrial sites for the goal of sustainability.

3.2.3 Methodology

In every research, its nature, demand and expectations prompt the adoption of a particular type of methodology. The type of methodology adopted for a study is critical as it predetermines the way data is communicated and classified for the purpose and aim of the overall research. It is always important to understand the nature and relationship among variables and perhaps how research questions and objectives have been formulated in order to select the best methodology for a study (Doyle et al., 2019; Doyle, Brady and Byrne, 2009). Within the pragmatism context, there exists the flexibility for the use of the mixed methods approach, which makes use of the efficiencies within both qualitative and quantitative data and methods. With this stated, both opened and closed ended questions can be deployed in gathering data with a high level of adaptability in integrating these data and analysing them throughout the research process (Creswell and Tashakkori, 2007; Doyle, Brady and Byrne,

2009; Creswell, 2014). Hence, effectively address the research objectives indicated earlier, the qualitative method was used appropriately in the study to achieve this goal.

3.3 Research Design and Approach

3.3.1 Qualitative Research: The Case Approach

According to Creswell (2014) the case study research approach and design offers researchers the chance to gather relevant information about a particular place over a sustained time period. This motive then allows for well-focused research results that have a direct link and relevance to the objectives and research questions. Specifically, the approach is recognised as “a design of inquiry found in many fields, especially evaluation, in which the researcher develops an in-depth analysis of a case, often a program, event, activity, process, or one or more individuals” (Creswell, 2014 p 41). Additionally, a case study seeks to “generate an in-depth, multi-faceted understanding of a complex issue in its real-life context. It is an established research design that is used extensively in a wide variety of disciplines, particularly in the social sciences” (Crowe et al., 2011).

With the use of a case study, researchers are able to achieve a naturalistic relationship with respect to the phenomena being understudied, unlike an experimental design or model, thus eliminating any use of trial or experimental that simulates events (Creswell and Tashakkori, 2007; Crowe et al., 2011; Creswell, 2014). A case study has also been categorised into three types; intrinsic case study, instrumental case study and collective case study. An intrinsic case study reflects on the uniqueness of a case prior to its selection, while an experimental case highlights one particular case that is better than others to provide extensive results. In considering a case study, there is the implementation of a broader appreciation of events where multiple cases are used for the purpose of comparison (Stake, 1995; Crowe et al., 2011). This study uses the intrinsic case study approach.

3.3.2 Motivation for the Selection of Peterborough as a Case Study

Peterborough, Ontario, has a strong industrial history that includes industry, mills, and railway transportation. With conventional industries declining and a growing desire for sustainable urban development, adaptive reuse of old industrial sites has emerged as a tempting alternative. This case study investigates why Peterborough is an appropriate place for adaptive reuse efforts, highlighting its historical relevance, community participation, and possible economic advantages. Peterborough's industrial background extends back to the nineteenth century, when diverse manufacturing enterprises such as ironworks, foundries, and textile mills emerged. The Ashburnham Foundry, for example, provide unique prospects for adaptive reuse projects. Preserving and adapting historical and heritage sites into contemporary, useful places protects the city's historical character while also contributing to long-term urban regeneration.

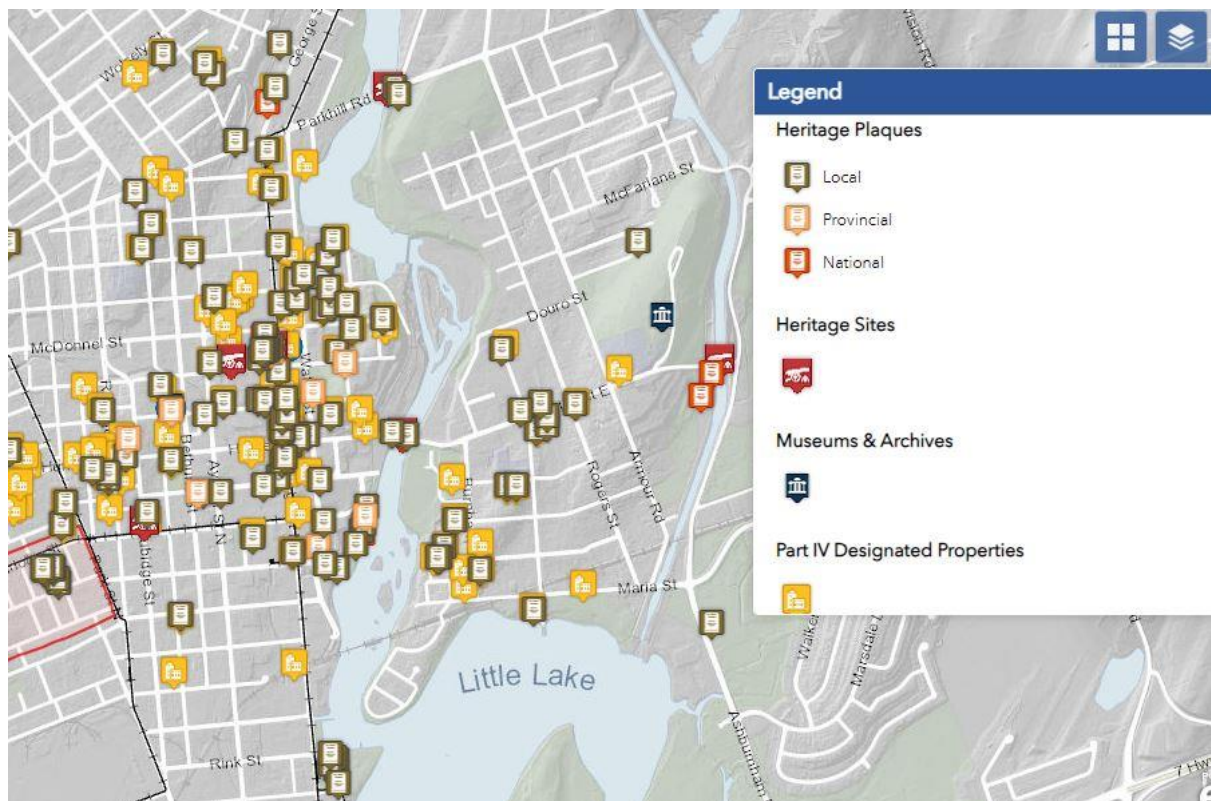


Figure A: A Map of the Historic and Heritage Sites, Peterborough



Figure B: The Old Colonial Weaving, Peterborough



Figure C: The GE Property Building

Peterborough, Ontario, makes a strong argument for the adaptive reuse of historic industrial sites. Its rich industrial past, strong community engagement, sustainability commitment, potential economic benefits, and architectural significance make it an ideal location to illustrate the success of such projects. Peterborough can honor its past while also paving the way for a bright and sustainable future by embracing adaptive reuse (Bullen and Love, 2011; Günçe and Mısırlısoy, 2019). The inclusion of the Indigenous communities' viewpoints and values should also be taken into account during the reconstruction process because these places have cultural and historical significance for the Indigenous populations (Boarin, 2019; Gravagnuolo et al., 2017). Indigenous people have participated in many ways, including through dialogue and cooperation with local authorities and development organizations (Dabin et al., 2019). Indigenous groups are contacted before making decisions,

and they offer their perspectives and recommendations for the adaptive reuse of these locations. The reconstruction designs are more respectful of Indigenous cultures and traditions thanks to their involvement. Indigenous people have also contributed to the planning and design of these initiatives including adaptive reuse. Ensuring that the redevelopment follows sustainable techniques and respects the environment, they provide their traditional knowledge and skills in land management and sustainability (Boarin, 2019; Gravagnuolo et al., 2017).

When cultural values, and historical relevance are acknowledged in the adaptive reuse of historic and heritage industrial sites in Peterborough. The community and tourists may experience a more welcoming and culturally diverse environment (Boarin, 2019; KWIC, 2021).

In terms of heritage and cultural sites, Peterborough has several institutions that play a significant role in the history and identity of the city. The City of Peterborough's Heritage Preservation Office (HPO) creates and oversees programs for the preservation of the city's historic sites, including buildings, landscapes, and archaeological sites. The HPO collaborates with various City departments on a variety of topics connected to built heritage and offers advice on heritage matters to committees and Council as well (Peterborough, 2022).

Specifically, the Heritage Preservation Office executes the following functions:

- i. Heritage designation under the Ontario Heritage Act;
- ii. Permitting and financial incentives for individually designated properties and heritage conservation district properties;
- iii. Planning heritage events;
- iv. Educational programming related to heritage;
- v. Coordination of archaeological services for all City departments.

As part of the City of Peterborough's contribution to preserving heritage and keeping stakeholders satisfied, the City in summer 2022, started doing a Heritage Conservation District Study for the downtown as the initial stage in the procedure. Following the Study, a plan with recommendations for conserving the downtown's historical elements would be prepared and presented to the City Council for approval (Peterborough, 2022).

Additionally, the Historic Commercial Core's heritage character will be investigated, documented, and its heritage resources will be evaluated in this study. A Legacy Conservation District designation for the region and other suitable mechanisms to safeguard its heritage would be decided upon using the findings from the Study. Historic districts and neighbourhoods are essential to the growth and character of the city. Their careful maintenance and protection helps every member of the community. (Peterborough, 2022; Welcome Peterborough, 2022).

The City of Peterborough was being selected for its unique characteristics being strong community engagement, environmental benefits of adaptive reuse to the city, revitalization of neglected areas, economic advantages from historic areas and its commitment to preserving architectural heritage (Lak and Hakimian, 2019; Hussein et al., 2020; Bullen and Love, 2011; Günçe and Mısırlısoy, 2019).

3.3.3 Data Collection and Analysis

At the core of this study is the use of a qualitative methods approach, which allows for a comprehensive investigation of the current state of affairs regarding adaptive reuse of historical and heritage industrial sites in Peterborough. The next section will explain the methods used in this study including the conduct of interviews for data collection, the approach to data analysis, and how findings will be presented, discussed, and analyzed.

Secondary Data

Peer-reviewed articles used in this process will be vetted to make sure they are extensively related to the focus of this research. This is a widely accepted practice in order to get valid data and inputs for the (Creswell, 2014). In addition to these sources, the official websites, databases, and portal were accessed to gain secondary data on relevant and related information for the study. Scopus, Web of Science, Science Direct, Google Scholar, and JSTOR were the major journal databases used a source for secondary data. The website of the City of Peterborough also provided vital information for this study including contact of respondents and recent events. The secondary data collected were sorted based on their relevance to this study and categorized into themes. These themes formed that basis of arguments and references to the data collected from the interviews.

Primary Data

The study implemented one main data collection instrument for gathering specifically primary data: a semi-structured interview. It is important to note that the interview will offer parameters for examining and evaluating the themes under which data is being collected for further analysis. The semi-structured interview was conducted to purposefully select ten (10) respondents who are knowledgeable within the area of study from the already identified relevant departments within the City of Peterborough. The research subjects were recruited after explaining the goals and objectives of this study to them through a first time meeting and by email. A response was received by informants who were capable of providing the information and other who were not recruited due to lack of capacity to answer the questions, provided referrals to other subjects.

Provisions was made for both face-to-face and telephone or online interviews to mitigate against any unforeseen restrictions. This also provided a desired level of comfort for

both the interviewer and the respondent, depending on their current state of affairs as of the date the interview is scheduled to be conducted (Creswell, 2014). The interview largely covered questions that are directly linked to the study, with the flexibility of allowing respondents to provide additional information when necessary. The next section provides an overview of the informants (anonymized) for this study.

Anonymized Interview Informants

Informants/Respondents	Department or Position
Respondent I	Peterborough Historical Society
Respondent II	Heritage Department, City of Peterborough
Respondent III	City of Peterborough Infrastructure and Planning Services Department
Respondent IV	City of Peterborough Infrastructure and Planning Services Department
Respondent V	Hutchison House Museum
Respondent VI	Heritage Department, City of Peterborough
Respondent VII	Hutchison House Museum
Respondent VIII	Heritage Department, City of Peterborough
Respondent IX	Peterborough Historical Society
Respondent X	City of Peterborough Infrastructure and Planning Services Department

With the qualitative data collected through the adopted data collection methods, the study adopted an approach where responses are hand coded into themes and summarized in order to present the findings. Since the number of respondents isn't enough to require the use of qualitative data analysis software, this approach will be effective. In addition to the data gathered from journal articles and official databases and sources, it will be summarized and then linked to the objectives based on an extensively conducted interpretation (Creswell, 2014).

3.4 Ethical Considerations

The method for ethical considerations begins with the submission of an application using the Trent University website's Romeo portal. This application contains critical information about the research, such as the timeline, supervisor involvement, and sample procedure. Documents such as the informed consent letter and interview guide must also be supplied. Following that, the application is reviewed, beginning with your supervisor's assessment and possibly necessitating modifications. The application is submitted to the Ethics Board for complete ethical examination once it has been authorized by the supervisor. You gain clearance for your research after appropriate clarifications and revisions, allowing you to begin data collecting while adhering to the accepted ethical norms. After the research with human subjects is completed, a closure application is filed for approval by the Ethics Board to confirm that ethical standards are upheld throughout, thus ending the research process. All ethical considerations prescribed within the university's framework, especially with data usage and disposal, were implemented.

3.5 Concluding Remarks

The research approach is described in this chapter. The study used a qualitative approach, allowing for the collection and analysis of data in a real-world environment. The City of Peterborough was selected as the case study due to its special characteristic of having a well-constructed map that illustrates land usage. This offered the chance to undertake a thorough investigation. Data from the research were both primary and secondary. While secondary data came from already-existing databases and research papers, primary data came from a semi-structured interview. The researchers took care to follow all ethical guidelines outlined within the university's framework, especially with regard to the use and disposal of data.

ANALYSIS AND DISCUSSION

4.1 Introduction

This section provides an analysis of the data gathered from interviews and secondary sources. In addressing the research question "What is the nature of adaptive reuse of historic and heritage industrial sites in Peterborough?", semi-structured interviews were used to gather data on adaptive reuse practices. The questions asked during these interviews addressed the main research objectives of this study: the challenges involved in reusing old structures, best practices for regaining abandoned building usefulness, initiatives of stakeholders to assist adaptive reuse of heritage and historical sites and identifying the nature and kinds of structures being reused in the City of Peterborough. Information gathered from participants is analyzed using themes collected in other scholarly works.

The chapter is divided into sections based on the themes being analyzed. First, a section on the challenges involving in reusing old buildings and sites in Peterborough. The section identifies the best practices for regaining abandoned buildings usefulness, the initiatives of institutions; for instance, the community improvement program incentives for remediation of brownfields and lands that are contaminated in Peterborough. The third theme discussed is the initiatives of both private and public stakeholders aimed at restoring abandoned structures. The role of the City of Peterborough's Heritage Committee which carries out activities aimed at maintaining heritage places was seen as central to restoring designated heritage buildings. The nature and kinds of structures being reused were also analyzed, which pointed to, for example, old hospitals and worship places that were easily repurposed into residential facilities. However, industrial sites are usually contaminated, making it a challenge to easily convert them to residential facilities. Additionally, the design of historic or heritage industrial sites and buildings also makes it difficult to repurpose the old structures with modern features that accommodate the requirements of accessibility. The analysis and discussion of the findings of

this study are framed by a literature review of adaptive reuse in terms of its challenges and best practices.

The study emphasized the role of the three main levels of government: the federal, provincial and municipal governments. The provincial level usually implements the strategies of the federal government, although it sometimes has its own policies and objectives in the adaptive reuse of historical and heritage sites or buildings. One of the respondents from the Heritage Department noted that the provincial level of government occasionally seeks funding and other forms of support, like expertise, from the federal government. The issue of tax relief is generally a coordinated endeavour between the federal and provincial levels of government in Canada. Specifically, establishing and maintain zoning or building codes as noted in this study is the responsibility of the municipal level of government. A summary of the adaptive reuse programs and the main players involved is provided below:

Programs, Level of Government and Main Objectives

Program	Political Entity	Main Objective
Municipal Incentives for Affordable Housing	Municipal (coordinated with Federal and Provincial)	Residential purposes; to support the affordable housing program.
The Community Improvement Program Incentives	Municipal	Remediation strategy to regain sites for adaptive reuse.

4.2 Challenges Involved in Reusing Old Structures in Peterborough

4.2.1 COVID-19

In investigating the challenges involved in reusing historical and heritage industrial sites and buildings, one of the most recent events that affected all sectors of the economy, the COVID-19 pandemic, was identified as one of the challenges. COVID-19 affected the operation of all institutions in charge of adaptive reuse activities in Peterborough, Ontario, and

Canada as a whole. In Peterborough, COVID-19 forced organizers of adaptive reuse related events to transition to the online platform, limiting the ability of participants, public and private stakeholders to fully explore historical and heritage buildings and sites. A critical look into the period between 2019 and 2022 of the pandemic did not put a stop to the interaction among experts in the field of adaptive reuse.

The main challenge presented by COVID-19 was its limitation on the activities of all stakeholders in adaptive reuse since there were restrictions on movement and access to several public spaces. With heritage and historical industrial sites and buildings being regarded as public spaces, visitors were especially deprived of full access and the ability to explore such sites in the City of Peterborough. According to Barker (2022), Doors Open Peterborough returned to the in-person format after the COVID-19 pandemic. This annual event has been under the sponsorship of the Peterborough and Kawarthas Association of Realtors, under the auspices of the City of Peterborough. For instance, in May 2022, participants and visitors were given the chance to explore five (5) buildings in Peterborough, which included Y Lofts (formerly Peterborough's historical YMCA), King George Public School, Peterborough Theatre Guild, PCVS, and Peterborough Museum and Archives (Barker, 2022).

Within a wider context, the COVID-19 pandemic challenges the entire tourism industry (Amato et al., 2021). A significant number of repurposed buildings serve as tourist attractions, and with the introduction of COVID-19-related restrictions, including a ban on travel and access to public spaces, most stakeholders, both private and public, were not able to engage with these sites or buildings to make proposals for how they can be repurposed based on new functions and designs. According to Arfa et al. (2022), adaptive reuse is a complex process requiring access to vital information, especially in the case where the values of heritage buildings need to be preserved. This mandates the involvement of certain individuals, such as historians, who are abreast of relevant details and information on buildings and sites. In

Peterborough, the COVID-19 pandemic did not permit this necessary interaction between historians and potential investors or designers. According to Barker (2022), that it was only after the COVID-19 restrictions were lifted that local historians in Peterborough were able to lead walking tours to explore historical and heritage landmarks and sites, for example, Confederation Square. For a proper integration of heritage or historical industrial sites into Peterborough, there should be no hindrance in accessing relevant information on sites, which can only be obtained from individuals such as historians.

With reference to the data gathered from participants, it was realized that COVID-19 also affected the day-to-day administration of institutions that carry out related activities in adaptive reuse and ensure heritage buildings are well managed. It took the government to intervene by providing funding to ensure the operations of these institutions, for instance, the Peterborough Historical Society, are kept running. This is expressed below by Respondent I:

We have other grants from other not municipalities but other levels of government provincial federal etc. And during COVID there were special grants to keep the institution going during COVID as there were for other agencies and other businesses... (Respondent I - Peterborough Historical Society).

COVID-19 pandemic affected the normal functioning of institutions and bodies that handle activities of adaptive reuse of historical and heritage industrial sites in Peterborough over a period of time, hence being considered a challenge.

4.2.2 Political Will

Lack of political interest was also examined as a challenge for adaptive reuse of heritage and historical industrial sites in Peterborough. Due to the complex nature of the adaptive reuse process and the financial commitment required, getting support from the ruling government is necessary for a successful adaptive reuse program. Politics plays an important role in the level of investment in maintaining the heritage and cultural values of a city or nation. According to

Amato et al., (2021), political instability and the readiness of a government to invest in its cultural sector show an inverse relationship.

Additionally, when institutions such as the Heritage Preservation Office are engaged in adaptive reuse activities for residential purposes that support government initiatives, it becomes much easier for them to obtain aid in the form of funding or incentives. The introduction and continuation of affordable housing projects was seen as a major gateway to gaining political will and access to federal and providential incentives. The support provided by relevant institutions in relation to enhancing the well-being of individuals through their supportive role has been explained by scholars such as Rosenbaum et al., (2021) as essential in supporting the activities of governmental agencies. Adaptive reuse initiatives that are in line with government goals in areas such as education, health, housing, and other social services are easily supported by both the federal and providential levels of government since they encourage sustainable living and limit, if not totally eliminate, the financial burden on agencies or associations that engage in adaptive reuse of heritage buildings and sites (Othman and Elsaay, 2018; Ikiz Kaya, Pintossi and Dane, 2021; Rosenbaum et al., 2021). When asked about political interest Respondent III said:

No other than like the municipal incentives though depending, so if it's being reused for residential purposes, we have incentives. If you're introducing affordable housing, there's incentives. So there are incentives, municipally, and some of them have affiliations with provincial and federal money as well, particularly if it's for affordable housing. But, yeah, I'm not aware of all of the various provincial and federal programs available. (Respondent III# City of Peterborough Infrastructure and Planning Services Department)

Although political scenarios like political instability and the lack of interest by a ruling government in supporting conservation and preservation heritage and historical values may provide a challenge to the success of adaptive reuse of historical sites and buildings, this is not the case for Peterborough. The analysis indicated that, Peterborough has access to both federal and provincial support for its activities in adaptive reuse hence political will does not pose any

challenge. This is due to the constant support from the government for instance the commitment of the provincial Ministry of Environment at the provincial level.

4.2.3 Engagement and Design

The adaptive reuse of historical and heritage industrial sites in Peterborough is composed of a complex interaction or engagement among stakeholders, including communities, government, and private agencies. The implementation of policies and the execution of various processes like site evaluation, deciding on how to retain the design and patterns of buildings, and measures to retain the cultural value of buildings and sites require deliberations among entities such as the Peterborough Historical Society, Hutchison House, the City of Peterborough, the Heritage Department, the City Council, Trent Valley Archives, museums, and general members of the community who are duly represented through associations.

Brief Description of Key Organizations

Organizations	Description
Peterborough Historical Society	They take part in events that highlight Peterborough's rich social, cultural, and architectural heritage.
Hutchison House	A museum with relics dating back as the 1800s.
The Heritage Department, Peterborough	Department in-charge of activities that aids preservation of historic structures.
Trent Valley Archives	An NGO in-charge of keeping archives.
Peterborough Architectural Conservation Advisory Committee	They provide advice on environmental matters related to the city of Peterborough municipal projects.

According to Lynch and Drew (2020), there is always a challenge for stakeholders when deciding how to effectively and efficiently utilize these cultural, social, and infrastructural assets. Particularly with the cultural and social aspects, communities are very skeptical about how adaptive reuse programs can be successful and also retain the cultural or heritage value of these sites and buildings marked for repurposing. Pintossi et al., (2021) supported the assertion of the need for several stakeholders to be engaged in decision making by recognizing the essence of a multilevel stakeholder engagement process. Engagement is necessary to meet the interests of communities, such as the value of culture and heritage, while also adhering to the zoning codes and regulations for successful adaptive reuse.

The City of Peterborough was noted to have a challenge with the design of buildings since it tries to retain most of the aesthetic and cultural elements that retain and strengthen the connection between stakeholders such as communities and these historic sites and structures. Over the years, the authorities of the City of Peterborough have tried to achieve a balance between living in the contemporary era and that of the nineteenth and twentieth centuries. For instance, the application of the principles of a living history museum from the nineteenth century to modern museums will require extensive consideration of what needs to be preserved and current museum trends and practices in order to achieve a balance between history and modernity. One respondent indicated the difficulty in achieving this balance:

...Yes we've had some.. some shifts it's very difficult because it's a living history museum so we have a fireplace downstairs and that was the heating system when people lived here in 1837 right the way through until you know in the 20th then there were at one time there was probably a coal furnace and then it became an oil furnace and... We.. we have a heat pump which is a modern adaptation. I believe it's a heat pump who replaced our most recent furnace. So.. so we try and keep within current... But if you're if you're trying to have a museum that illustrates not life in 2023 but life in 1837... and then you have to go with how things were then, not how things are now. So, it's a little difficult to try and apply those principles to a living history museum from the 19th century. Yeah, or it's very difficult, shall we say. (Respondent I - Peterborough Historical Society).

In Peterborough, the process of repurposing these heritage and industrial structures also requires consideration for design and structural elements such as heating systems, elevators, safety, and fire assembly points. According to Dionisio and Carr (2022), communities are challenged when engaging in adaptive reuse in dimensions such as the geographical location of structures, historic relevance, design, and cultural value. Although the dimensions stated earlier are necessary for consideration, design remains an issue of contention as it is subject to changes based on the specific era. For instance, the design that was appreciated in the 19th Century could be seen in the 21st century, although its historic and cultural value remains.

Over the years, adaptive reuse has moved towards a value-based agenda for addressing and meeting technological needs and user demands (Yazdani Mehr, 2019). Contemporary development means that stakeholders, especially government institutions responsible for rejuvenating old structures, put up guidelines and policy frameworks that can merge both old and contemporary reuse practices, including designs.

This approach of merging both old and contemporary designs in the analysis was explained as achieving an "inclusive design," and respondents noted that this was a task and a challenge. This challenge is primary due to the inability to effectively change the design of certain structures or buildings to accommodate modern requirements of accessibility, such as wheelchairs, elevators, and even proper evacuation plans in case of fire or other emergencies. A respondent from the Peterborough Historical Society explained how it was difficult to actually meet the guidelines of the Accessibility for Ontarians with Disability Act (AODA) when considering some structures for adaptive reuse. When asked about inclusivity Respondent I said :

Inclusive in what way? Like we've adopted, we have at the back of the building, we have a wheelchair ramp that brings people in... if you're in a wheelchair and come in the back, that's the store here. And then the washroom downstairs is fully accessible. [Okay]. There isn't a lift in the building because they didn't have lifts in 1837. So we're kind of exempted from, and it would be very difficult in the building of this dimension to start putting lifts or elevators in... But in terms of accessibility, I believe, as a living

history museum, we meet the AODA standards in terms because we did apply for a grant and we did put in a wheelchair ramp. And we do, as much as possible, we do try and provide access. [Okay], and the best... (Respondent I - Peterborough Historical Society).

In Peterborough, communities will be eager to maintain the cultural identity that comes with historical and heritage sites or buildings. This is why inclusive design is necessary to prevent any loss of connection with sites or structures after they are repurposed. Both present and future generations are expected to benefit from the cultural and historical value provided by these sites, which have stood the test of time. The government and private agencies will typically be engaged in addressing this challenge.

In a comprehensive explanation specific to heritage and historical sites, the design of structures identified for reuse was enough to stop the entire adaptive reuse project in Peterborough. This was the case at Bonnerworth Mills, where floods tore the place up, resulting in the need to repurpose the structure. It was noted that the design of Bonnerworth Mills made it difficult to incorporate requirements such as new elevators and sidewalks. The existence of dark corners was also a concern for the repurposing into, for example, residential uses due to the possibility of encountering a lot of criminal activities. It was clearly established that Bonnerworth Mills and other structures in the City of Peterborough paid less attention to accessibility as a standard requirement. It is not surprising that Misirlisoy and Gunce (2016) explained how these recent years of adaptive reuse have placed specific regulatory requirements and considerations on designers and planners. The comprehensive assertion of the case of Bonnerworth Mills is expressed here by a respondent II from the City of Peterborough:

I'm trying to think of one where industrial or environmental design actually stopped a reuse. I know that it can add a lot of money and elevators are a perfect example like the Bonnerworth Mills they were doing at the time right after the flood and they ended up having to tear out much of the interior that they'd hoped to use but that those buildings I think required new elevators and lots of these buildings are not designed for you know

general safety in their design you know there are dark corners and you know places where you know you know that there are opportunities for criminal activity to happen because there's no way to there's no surveillance for them you know long hallways the other I mean not necessarily about industrial buildings. But I know that in the downtown, one issue we face is very few of the storefronts have a level entry off of the sidewalk. So you've got to go up two steps or one or two steps to get into a lot of them, especially on George Street, which is sloping downhill. And trying to figure out how to get a ramp up to those entries takes up too much the sidewalk. We'd end up having to take parking out, extend the sidewalk into the street to allow a ramp to access a storefront. The individual properties are also often not wide enough that you could get a ramp up at a reasonable incline to meet accessibility requirements. So, not necessarily, as I say, around the industry, but most buildings built before, I would say maybe the 1990s, really didn't incorporate accessibility as a standard requirement (Respondent II – The Heritage Department).

There is a clear indication that structures built in the 1800s and 1900s may have neglected the need for accessibility and other structural requirements like elevators, thereby creating a challenge now in terms of adapting the buildings and structures for reuse. This challenge, according to Naima (2021), can be curbed through community-led initiatives focused on heritage rehabilitation and cooperation among various stakeholders to find the best function for structures that may need a total functional overhaul to be put to a new use (Bullen and Love, 2009; Ikiz Kaya, Pintossi and Dane, 2021; Naima, 2021).

4.2.4 Financing

Adaptive reuse requires a lot of financial commitment and a suitable economic condition in order to be successful. According to Mohamed et al., (2017), economic conditions and financial constraints can affect the timeline of adaptive reuse projects. While access to finance has been noted as a challenge, it was identified that the City of Peterborough presents a different case where finance isn't necessarily a challenge. The main institutions or agencies in Peterborough that are in charge of the adaptive reuse of historical and heritage industrial buildings are generally funded by the federal or provincial government. This source of funding for institutions such as related departments in the City of Peterborough eliminates the need to

consider finance as a challenge for adaptive reuse. However, this does not ignore the role played by private investors, who will have to understand the current economic situation and the return on their investments before making funds available. Fundamentally, the government concerns itself with adaptive reuse activities, and this makes it a core objective to include such expenditures in their budget preparation. Additionally, the position of the government to support adaptive reuse processes in the City of Peterborough can even be seen in its support for departments within the City during the COVID-19 pandemic. Meanwhile, the Peterborough Historical Society noted that, museums in the City of Peterborough face financial challenges; however, support from the government is enough to curb the impact it could have on their operations. As Respondent I noted below:

I don't know, I mean, we'd have to be going after, do we go after funding? Like, I'm not sure grants are something the city does as much as gives them out more than it sort of seeks granting. Yeah, I mean sometimes we go after... there are federal programs for housing, for instance. (Respondent I – Peterborough Historical Society).

In addition to going after the funding for adaptive reuse and related projects, there are some specific programs in Peterborough, like the Brownfield Community Improvement Program, which is an example of an incentive for the reuse of industrial buildings or property. In the case of private development, the City of Peterborough is not able to secure funding since it is outside of their jurisdiction and focus. There are grants provided for public development, such as affordable housing. Reusing heritage or historical sites for affordable housing contributes to the government's overall goal of tackling housing issues. As noted by one respondent, adaptive reuse makes affordable housing a favourable endeavour worthy of government support:

Yeah, we're not really in the development business. I mean, we respond to development applications. So it's something that, like Respondent II - says, we give them out, we provide incentives and the Brownfield Community Improvement Program would be an example of an incentive for the reuse of an industrial building or industrial property. But yeah, we don't really secure funding for private development, that's sort of outside

of our... (Respondent III - City of Peterborough Infrastructure and Planning Services Department).

Adaptive reuse requires significant investments in funds from the government as a result of the high restoration and maintenance costs. Since private entities may not be able to cover all these costs, it is required that the government express its willingness and readiness to implement policies that support the preservation of heritage and the conservation of cultural values (Amato et al., 2021). This goal can be partly achieved by the government supporting adaptive reuse programs. The case of Peterborough, Ontario, presents a different case where the central government, municipalities, and other relevant institutions (for instance the Peterborough Historical Society) have the will and capacity to support the activities of heritage conservation and adaptive reuse. An evaluation of the responses shows a significant level of support from the federal and provincial levels in supporting the adaptive reuse processes in Peterborough. It was realized that the federal government, through the implementation of the National Historic Sites Costs Sharing Program, which is a program aimed at protecting and presenting places of national historic relevance, provides extensive support for activities from a heritage perspective. However, it was further noted that this form of "tax relief" was widely available to buildings and sites designated as or falling within the description of a "National Historic Site". This was expressed in one of the responses from the Heritage Preservation Office in Peterborough, which is in charge of administering all heritage programs for the city, including heritage protection initiatives. One respondent from the Heritage Department noted that tax relief significantly improved adaptive reuse activities:

I mean that from a heritage perspective the province pretty much downloaded any [any] incentive programs to the municipality when it allowed for tax relief. There were some small incentives, financial incentives before that, but basically the province has said, you know, it's up to municipalities to provide incentives and we'll allow you to do it through tax relief. Federally, I don't think there's anything from the heritage perspective right now. There is a national historic sites cost sharing program, but unless the building is a National Historic Site, they can't take advantage of that. I don't know, I don't think

we've got...I don't think there's much else... (Respondent II – The Heritage Department).

Financing for the adaptive reuse program in the City of Peterborough, based on the analysis of the responses from the participants, when there is a wait between going after funds and the government making them available. As far as the City of Peterborough engages in public development projects like adapting and reusing heritage and historical buildings for residential purposes to support the government's affordable housing program, there is less chance of having finance headlined as a challenge.

4.2.5 Site Contamination

As part of the challenges examined in this study, there was an additional revelation that previous studies have not fully examined. The City of Peterborough, when considering adaptive reuse of heritage and historical industrial sites, has to deal with the issue of contamination. In support of public development, most industrial sites or structures would be favoured for repurposing into residential sites or buildings. However, aside from the challenge of the design of these industrial structures, these sites are contaminated since they were once used for industrial purposes. As one respondent noted, site contamination has been a challenge to adaptive reuse in Peterborough, which further negatively affects municipal efforts to achieve low rents through repurposing these industrial sites into residential structures. When asked Respondent II said:

Right, right. [Yeah], so I mean the big one as I say that comes to mind is..Is general electric, but I know that there are issues around contamination on that site. And that would be the biggest stumbling block, I guess, to its adaptive reuse. (Respondent II – The Heritage Department).

This challenge from an industrial perspective oftentimes makes it only possible to reuse the administration buildings because the factories themselves may be contaminated. An

instance in Peterborough is The Canoe Museum site in the Old Outboard Marine Corporation, which is the factory where they kept various collections. However, the site (old factory site) couldn't be used for anything because of contamination, but they were able to use the headquarters building, which served administrative purposes as said by Respondent II in the Heritage department . In this case, the administration building was reused as a museum, so there was an adaptive reuse of the administration building, if not the factory itself. Currently, the City of Peterborough's Infrastructure and Planning Services is dealing with a highly intensive residential development based on the site plan for the old Westclox property in cooperation with the Skyline Development Cooperation. As one respondent noted, this has been time-consuming as the site itself has been contaminated, requiring extensive processes for remediation before the initiative can proceed:

And we're dealing now with a site plan, like we dealt with the official plan or the [zoning] by-law amendment a couple of years ago and now we're dealing with a site plan for [the old] the Westclox property that I was speaking of the Skyline Development Corporation is [is] proposing a fairly intensive high density residential development there but there you know there is there are some with contamination still on that site so that has to be remediated before they can they can proceed which they are working on but you know it's costly and time consuming and really you know records of site condition are pretty standard for any change in land use from an industrial particularly used to anything that's more sensitive. So even to commercial or like we've seen with the new urban park downtown, we were required to secure a record of site condition for some contamination of those lands as well. (Respondent III - City of Peterborough Infrastructure and Planning Services Department)

Although contamination may seem difficult to deal with, stakeholders will have to weigh the investments that will go into remediating the site with the final value of the projects. This logic has been applied to the sites identified in Peterborough for adaptive reuse that have been exposed to contamination.

4.3 Best Practices for Regaining Abandoned Buildings into their Usefulness

In exploring the best practices for regaining abandoned structures and buildings that are later repurposed in Peterborough, respondents were questioned on the strategy, legal processes, cultural considerations, and stakeholders involved in regaining old structures. Practices of adaptive reuse require the clearing of ruins, followed by ways to integrate the designs of structures into modern societies (Ruiz-Pérez et al., 2019; Manganelli, Tataranna and Pontrandolfi, 2020). There exist strict guidelines and federal and provincial policy directions that aim at addressing pressing issues at identified sites, such as contamination. Several initiatives over the years have provided incentives for the City of Peterborough to fully engage in the adaptive reuse of heritage buildings. The study identified the "Community Improvement Program Incentives" for remediation of brownfields and lands that have been subject to industrial contaminants as one of the main official strategies for regaining abandoned buildings to be reused. The Community Improvement Program Incentives shows the City of Peterborough's commitment in simulating the development of affordable housing. It is a redevelopment program implemented across Ontario.

One of the main activities of both federal and provincial authorities in regaining buildings is to provide adequate financial resources in order to prepare sites for further reuse. It was noted that, the City of Peterborough ensures that there is "significant financial investment" available for adaptive reuse of industrial sites. Usually, this financial provision is made especially for the "cleaning up" of contaminated sites in order to curb the main challenge of contaminated sites when engaging in adaptive reuse in Peterborough. The remediation strategy, namely the "Community Improvement Program Incentive" which was identified as one of the official strategies of the City of Peterborough in regaining sites for adaptive reuse, aids in the transfer of site ownership to the public in the case where previous owners are less equipped to carry out a successful adaptive reuse program. As one respondent noted, the

Community Improvement Program Incentives encourages reusing all kinds of lands including contaminated land:

...the only thing I can think of is, you know the community improvement program incentives for remediation of brownfields and lands that are contaminated. So there is some policy direction to try to encourage the reuse and the cleaning up basically those contaminated lands and so that's implemented through you know these incentives but I'm not sure that how effective they are in terms of you know are we offering enough money to make it financially feasible for somebody to undertake that kind of an exercise. (Respondent III - City of Peterborough Infrastructure and Planning Services Department)

The interviewees recognized that, in the event that private entities are not able to handle their property tax, the best way is to hand over the management of the site to the government. The decision to take over lands and sites due to tax default and the inability to decontaminate sites is noted by a respondent to eliminate any further loss of value. When a respondent from the City of Peterborough Infrastructure department and Planning services department was asked about the question of landownership, they responded by noting the following:

I know that you know we're dealing with some lands that the city has, that have come back into the city's hands as a result of default on property taxes and because they're severely contaminated and there's challenges like the city, of course, is going to have the same challenge now as the landowner did, the previous you know the private landowner in terms of dealing with this property. So there's going to have to be a significant financial investment to clean up these lands... that probably exceeds the value of the land to begin with... And so that is that's a challenge and I would say it probably exists in many cases with the adaptive reuse (Respondent IV - City of Peterborough Infrastructure and Planning Services Department)

Aside from the government taking over lands or sites that are not well managed, one of the best ways of reclaiming lands is by proposing new functions such as museums or art galleries that can serve both the current generation and also showcase historical values. It becomes easy for identified sites to be repurposed into museums as one of the options used in preserving and conserving cultural values. The interviewees acknowledged the essence of museums since relics and structures are hardly disfigured. One respondent from the Hutchison

House Museum noted that, old structured were usually turned into things like museum and art centres.

In the City of Peterborough, evaluation of sites remains an integral part of the steps taken in regaining sites for adaptive reuse. One of the respondents, specifically from the Hutchison House Museum, indicated that the Peterborough Architectural Conservation Committee (PACAC) is primarily engaged in the evaluation of sites and structures for adaptive reuse. The PACAC consults other departments, such as the Department of Heritage, in responding to changes in provincial legislation. The introduction of the new wetland and natural heritage strategies places more emphasis on this cooperation.

Furthermore, adherence to regulations on zoning in the City of Peterborough is essential in discussing the best practices for adaptive reuse. Zoning provides information on what activities can be carried out in specific geographical areas. Issues that are supposed to be examined include the ability of the area or zone to support footings for new structures, a proper drainage system, and the assessment of any potential structural challenges. By paying attention to the specific requirements, the structural integrity of buildings or sites can be well assessed for adaptive reuse. Buildings are expected to meet thermal requirements and energy efficiency guidelines. In this regard, the study noticed the relevance of "site servicing," where accurate information is obtained on the critical infrastructure of a site or building (Elsorady, 2014; Bottero, D'Alpaos and Oppio, 2019). A respondent noted that, zoning describes the nature of use of sites:

... but if the zoning is still there gives a sort of an as-of-right permission to use it for an industrial purpose then we would you know and the use is not more sensitive so there is like despite you know the fact that there may be a commercial use permitted by zoning a commercial use a more commercial use may still trigger a record of site condition because commercial is considered to be a more sensitive land use than industrial. So there are criteria. Ultimately, the record of site condition is required at the time that we issue a building permit. So although we require that phase one of the environmental site assessment to be done typically through a planning application process. We cannot ultimately require the full record of site condition until building permit stage. So it gives the applicant the opportunity to continue to work towards their

record of site condition while they're going through the planning approvals process which can also be lengthy and costly yeah. (Respondent III- City of Peterborough Infrastructure and Planning Services Department)

However, the City of Peterborough sometimes considers rezoning, which it simply refers to as "change of use". This, on its own, fits within the main premise of adaptive reuse. Rezoning moves away from the official plan and functions of structures and towards new usage, as noted by Respondent III:

And a rezoning probably likely for industrial buildings if there's a change of use. And potentially an official plan amendment if the use really doesn't conform with the intentions of our official plan. And I mean, those studies that Respondent I talking about, there's everything from stormwater management to parking considerations, archaeology at our end is typically one. Traffic studies, like what happens if you convert a factory that's been abandoned and now there's 100 residential units in it, what does that do in terms of traffic on local roads... (Respondent III -City of Peterborough Infrastructure and Planning Services Department)

The City of Peterborough ensures building codes and zones are respected in order to save resources and avoid unnecessary and unintended investments in contaminated sites. In summary, the best practices for adaptive reuse in Peterborough are concerned with providing adequate financial resources for poorly managed sites, which then leads to the transfer of ownership to the public and adherence to zoning and codes.

4.4 Initiatives of Public and Private Stakeholders Aimed at Restoring Abandoned Heritage Structures in Peterborough

As part of understanding the nature of adaptive reuse of historical and heritage industrial sites in Peterborough, respondents were asked about the existence of initiatives by public and private stakeholders. These initiatives were specifically those that aid in restoring abandoned heritage structures. Adaptive reuse in Peterborough requires the cooperation of both the government and its institutions and private associations. This is due to the multilevel decision-making nature of adaptive reuse (Bottero, D'Alpaos and Oppio, 2019; Della Spina,

2021). In the case of respondents from museums in the City of Peterborough, the most notable public and private initiative is the provision of sponsorship. This sponsorship form of initiative usually involves financial support and other non-financial support for the activities of museums and institutions that help preserve and conserve heritage and historical structures. As noted by Respondent I, both public and private stakeholders are expected to have an interest in the program of institutions, for instance, if it focuses on adaptive reuse or other aims, before they implement initiatives as noted by Respondent I:

We do have some, some are in a sort of in a realm of sponsorships where people do things for us and it's more in the realm of sponsorship, say businesses who have an interest in heritage. (Respondent I – Peterborough Historical Society).

The City of Peterborough enjoys healthy consultation with its stakeholders through the exchange of ideas and comments on projects. This interaction leads to recommendations for projects or support for projects that aid in the protection of heritage. One of the respondents noted that from a planning perspective, it is typically best to reach out to those groups that are sort of critical based on our knowledge and information about the property or structures to ensure that there is enough information to comfortably go forward to council or higher authorities with a recommendation at the end of the day. As Respondent III noted, one of the entities involved in coordination with various stakeholders at different levels is the First Nations Communities, which helps with issues such as legal obligations in restoring heritage sites and structures:

I think First Nations communities are probably the most obvious part of that. The other one is sometimes things like if it's a designated heritage building there are legal obligations for council, you know, if a recommendation goes to council there are legal requirements of the Heritage Committee be consulted. Council doesn't have to take its advice, but it does by law have to seek its advice. So in one sense, that kind of stakeholder engagement is required by law. Sometimes it's just good planning practice, I suppose. (Respondent III - City of Peterborough Infrastructure and Planning Services Department)

In restoring abandoned heritage structures and sites, stakeholders like the Peterborough Historical Society are engaged with other bodies that have a similar interest in restoring heritage sites and cultural value. This is supported by proper planning, the gathering of relevant information, and making the right recommendations for the final decision to be taken.

4.5 Nature of Structures Being Reused in Peterborough

The study also examined the nature of structures that were reused in answering the research question. Although the study focused on heritage and historical industrial sites, respondents were given the opportunity to share their knowledge based on the general structures reused. In general, the City of Peterborough reuses various types of structures, including industrial and institutional ones. Institutional structures in Peterborough include churches and other administrative buildings. Old administrative buildings are usually preferred to industrial buildings due to the issue of contamination, which has already been mentioned as one of the challenges faced in adaptive reuse. A notable institutional building is The Mount Community Centre in Peterborough, which was formerly known as Mount St. Joseph. It was a former convent of the Sisters of Joseph of Peterborough.

The Mount Community Centre has been adapted for reuse, taking a look at its original purpose, which was for residential purposes. The final goal was to repurpose this complex into an affordable housing and food centre. This function indicates alignment with the government's housing objectives despite the complex being sold to a private developer. The Peterborough Poverty Reduction Network (PPRN) assessed the suitability of this complex to serve the purpose of the non-profit organization, which is The Mount Community Centre. As Respondent IX noted, there is a difference between adaptive reuse of industrial and institutional buildings:

Okay, that's interesting because most of the adaptive reuse we're doing isn't industrial buildings right now. It's old churches and other institutional buildings... Mount St.

Joseph's the old convent... St. Joe's Hospital up in East City is being rehabilitated, it was an abandoned hospital...But lots of the factory buildings, as I say, typically they get demolished when the companies leave. (Respondent IX - Peterborough Historical Society).

The City of Peterborough acknowledges that, it is easier to make proposals for new functions related to accommodation, which usually align with the government's policy of affordable housing. Therefore, to avoid the challenges identified in this study, which include design and the issue of site contamination, old hospitals, churches, and administrative structures (institutional historic and heritage buildings) are the defining nature of structures reused. According to the responses analyzed, the City of Peterborough would prefer to demolish the majority of industrial sites and start a project from scratch in order to eliminate several bottlenecks. When asked about demolition, Respondent IX noted that:

Outboard Marine Corporation is a good example, it was used for a while by the Canoe Museum, but once they move out, I think the plan is to demolish all those buildings and put a new bus transit yard there. I mean, the big one that we've reused is the Bonnerworth mills on McDonald Street that was converted to housing, but housing's always an issue because of contamination typically in the, you know, on the site, which may or may not be something that can be remediated, and if it can't, you know, those buildings often are simply demolished and the land left vacant. (Respondent IX Peterborough Historical Society).

While demolishing may not be the best option for retaining buildings if the City of Peterborough wants to retain heritage buildings, a number of industrial sites or structures call for this approach. In order to retain some cultural elements, it is important to recover some parts and integrate them into new buildings with a new structure.

4.6 Concluding Remarks

The chapter provided an analysis of the results of the responses gathered from the informants identified for this study. The obstacles, best practices, stakeholder activities, and characteristics of the repurposed structures were the main areas of attention. According to the study's

conclusions, COVID-19, political will, site pollution, and structural design all provide difficulties for implementing adaptive reuse. According to best practices, the City of Peterborough makes sure that building regulations and zones are followed in order to save money and prevent unintended and accidental investments in polluting regions. greatest practices state that some industrial sites or projects call for this approach, even if it may not be the greatest option if the City of Peterborough wants to safeguard heritage structures.

CONCLUSIONS

The study examined the nature of adaptive reuse of historic and heritage industrial sites in Peterborough, Ontario. Adaptive reuse of industrial historic sites has been reported to present a number of difficulties. This is mostly about the contamination of sites and how industrial buildings and sites can be quickly converted into reusable sites, as opposed to how easily existing residential structures can be converted to suit residential reasons. By placing historical and industrial sites at the core of analysis, this project will close a knowledge gap and add to the body of work on adaptive reuse. Industrial sites may be reused in Peterborough; however, unlike residential sites, there is a pollution risk that needs to be taken into account in the repurposing procedure. The study addressed the research aim by identifying the challenges involved in reusing old structures in Peterborough, identifying the best practices for regaining abandoned structures, examining the initiatives of various stakeholders aimed at restoring abandoned heritage structures, and finally, identifying the nature and kinds of structures being reused.

The study used a qualitative research design with a case study approach aided by a qualitative analysis. Data was collected through semi-structured interviews, journals, official websites, databases, and portals. Based on the findings of the study, COVID-19 was a difficulty since it interfered with the institutions' and organizations' regular operations when it came to managing the adaptive reuse of historical and heritage industrial sites in Peterborough. The success of adaptive reuse of historical sites and buildings may be hampered by political factors like political instability and a ruling government's lack of interest in supporting conservation and preservation of heritage and historical values, but this is not the case for Peterborough according to Bill 23 passed on November 2022. The design of the structures that were chosen for reuse, with a thorough explanation relevant to heritage and historical landmarks, was sufficient to halt the entire adaptive reuse project in Peterborough. This happened at

Bonnerworth Mills, when flooding destroyed the building and forced a change in use. An additional discovery that prior research had not thoroughly investigated was one of the difficulties this study looked at. When contemplating the adaptive reuse of old industrial and cultural buildings, the City of Peterborough must address the problem of contamination. Most industrial sites or buildings would be given preference for conversion to residential sites or construction in order to encourage public development. However, these sites are polluted since they were originally utilized for industrial purposes, which adds to the difficulty of designing these industrial structures.

In terms of best practices, in order to conserve resources and prevent inadvertent and unintentional investments in polluted areas, the City of Peterborough makes sure that construction rules and zones are adhered to. In conclusion, Peterborough's best practices for adaptive reuse centre on providing appropriate financial resources for underutilized properties, which eventually results in the transfer of ownership to the public and adherence to zoning and standards.

The study also looked at the initiatives of both public and private stakeholders in adaptive reuse in Peterborough. It was evident that stakeholders like the Peterborough Historical Society collaborate with other organizations that have a similar passion for preserving and restoring culturally significant buildings and locations. The First Nations Communities, which assist with concerns like legal requirements in restoring heritage sites and structures, are one of the groups participating in collaboration with diverse stakeholders at different levels. In the case of best practices, while tearing down buildings might not be the best choice if the City of Peterborough wishes to save heritage buildings, there are some industrial sites or constructions that necessitate this method. It's crucial to recover certain sections and incorporate them into new structures in order to preserve some cultural components.

This study made a novel contribution by unearthing site contamination as a major challenge faced by authorities when commencing or considering adaptive reuse of heritage sites or buildings. Site contamination can then be investigated in relation to how it can be sustainably addressed. Site contamination can also be examined in the context of how it influences the determination of new functions for sites and buildings that have been adaptively reused. Future studies can also focus on exploring the roles of federal and provincial institutions in contributing to the adaptive reuse of heritage and historical industrial sites. Also, the issue of political will and governmental support can be explored by including several cases. This will help in understanding the level of support given to adaptive reuse with reference to the various cities or provinces selected as cases.

REFERENCES

Adams, C., Douglas-Jones, R., Green, A., Lewis, Q. and Yarrow, T., 2014. Building with history: exploring the relationship between heritage and energy in institutionally managed buildings. *The Historic Environment: Policy & Practice*, 5(2), pp.167-181.

Ahmed, S., Ghalam, S.Z. and Moghaddam, D.V., 2020. Collective Memory, An Effective Tool for Adaptive Reuse in Modern Heritage: Challenges and Opportunities Identified in the Case of Gropius Törten Estate, Dessau. *Journal of Architectural/Planning Research and Studies (JARS)*, 17(2), pp.163–180. <https://doi.org/10.56261/jars.v17i2.223115>.

Aigwi, I.E., Ingham, J., Phipps, R. and Filippova, O., 2020. Identifying parameters for a performance-based framework: Towards prioritising underutilised historical buildings for adaptive reuse in New Zealand. *Cities*, 102, p.102756.

Aigwi, I.E., Egbelakin, T. and Ingham, J., 2018. Efficacy of adaptive reuse for the redevelopment of underutilised historical buildings: Towards the regeneration of New Zealand's provincial town centres. *International Journal of Building Pathology and Adaptation*, 36(4), pp.385–407. <https://doi.org/10.1108/IJBPA-01-2018-0007>.

AlSady, A., 2018. Historic Houses as Pillars of Memory: Cases from Cairo, Egypt. *Open House International*, 43(3), pp.5–13. <https://doi.org/10.1108/OHI-03-2018-B0002>.

Amato, A., Andreoli, M. and Rovai, M., 2021. Adaptive Reuse of a Historic Building by Introducing New Functions: A Scenario Evaluation Based on Participatory MCA Applied to a Former Carthusian Monastery in Tuscany, Italy. *Sustainability*, 13(4), p.2335. <https://doi.org/10.3390/su13042335>.

Arfa, F.H., Zijlstra, H., Lubelli, B. and Quist, W., 2022. Adaptive Reuse of Heritage Buildings: From a Literature Review to a Model of Practice. *The Historic Environment: Policy & Practice*, 13(2), pp.148–170. <https://doi.org/10.1080/17567505.2022.2058551>.

Baines, K. and Zarger, R.K., 2017. “It’s Good to Learn about the Plants”: promoting social justice and community health through the development of a Maya environmental and cultural heritage curriculum in southern Belize. *Journal of Environmental Studies and Sciences*, 7, pp.416-424.

Binney, M. and Hanna, M., 1978. Preservation pays. Tourism and the economic benefits of conserving historic buildings. *Preservation pays. Tourism and the economic benefits of conserving historic buildings*.

Boarin, P., 2019. Extending Temporary Appropriation Through Architecture: The Role of Adaptive Reuse in Shaping New. *Temporary Appropriation in Cities: Human Spatialisation in Public Spaces and Community Resilience*, p.195.

Bottero, M., D’Alpaos, C. and Oppio, A., 2019. Ranking of Adaptive Reuse Strategies for Abandoned Industrial Heritage in Vulnerable Contexts: A Multiple Criteria Decision Aiding Approach. *Sustainability*, 11(3), p.785. <https://doi.org/10.3390/su11030785>.

Bullen, P. and Love, P., 2011. A new future for the past: a model for adaptive reuse decision-making. *Built environment project and asset management*, 1(1), pp.32-44.

Bullen, P.A. and Love, P.E.D., 2009. Residential regeneration and adaptive reuse: learning from the experiences of Los Angeles. *Structural Survey*, 27(5), pp.351–360. <https://doi.org/10.1108/02630800911002611>.

Carra, M., Rossetti, S., Tiboni, M. and Vetturi, D., 2022. Can Urban Regeneration improve Walkability? A space-time assessment for the Tintoretto area in Brescia. *Transportation Research Procedia*, 60, pp.394–401. <https://doi.org/10.1016/j.trpro.2021.12.051>.

- Celadyn, M., 2019. Interior Architectural Design for Adaptive Reuse in Application of Environmental Sustainability Principles. *Sustainability*, 11(14), p.3820. <https://doi.org/10.3390/su11143820>.
- Chen, C.-S., Chiu, Y.-H. and Tsai, L., 2018. Evaluating the adaptive reuse of historic buildings through multicriteria decision-making. *Habitat International*, 81, pp.12–23. <https://doi.org/10.1016/j.habitatint.2018.09.003>.
- Chen, J., Judd, B. and Hawken, S., 2016. Adaptive reuse of industrial heritage for cultural purposes in Beijing, Shanghai and Chongqing. *Structural Survey*, 34(4/5), pp.331-350.
- Dawson, M., 2022. Wonderful Things: Managing Value in a Changing World. *The Historic Environment: Policy & Practice*, pp.1-4.
- Dabin, S., Daoust, J.F. and Papillon, M., 2019. Indigenous peoples and affinity voting in Canada. *Canadian Journal of Political Science/Revue canadienne de science politique*, 52(1), pp.39-53.
- DeVerteuil, G. and Manley, D., 2017. Overseas investment into London: Imprint, impact and pied-à-terre urbanism. *Environment and Planning A: Economy and Space*, 49(6), pp.1308–1323. <https://doi.org/10.1177/0308518X17694361>.
- Dewiyana, E., Ibrahim, N. and Hajar, N.H., 2016. The Green Aspects of Adaptive Reuse of Hotel Penaga. *Procedia - Social and Behavioral Sciences*, 222, pp.631–643. <https://doi.org/10.1016/j.sbspro.2016.05.220>.
- Dionisio, M.R. and Carr, J., 2022. Prismatic immersion of urban ruins: A framework for the integration of ruins' multiple geographies in urban regeneration. *Cities*, 130, p.103818. <https://doi.org/10.1016/j.cities.2022.103818>.

Elsorady, D.A., 2020. Adaptive reuse decision making of a heritage building antoniadis palace, Egypt. *International Journal of Architectural Heritage*, 14(5), pp.658-677.

European Commission (2021, July 14) A European green deal, Brussels: Office of Official Publications of the EU. Available at https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en (accessed 13 April 2023).

Figueiredo, Y.D. dos S., Prim, M.A. and Dandolini, G.A., 2022. Urban regeneration in the light of social innovation: A systematic integrative literature review. *Land Use Policy*, 113, p.105873. <https://doi.org/10.1016/j.landusepol.2021.105873>.

Günçe, K. and Mısırlısoy, D., 2019. Assessment of adaptive reuse practices through user experiences: traditional houses in the walled city of Nicosia. *Sustainability*, 11(2), p.540.

Gravagnuolo, A., Girard, L.F., Ost, C. and Saleh, R., 2017. Evaluation criteria for a circular adaptive reuse of cultural heritage. *BDC. Bollettino Del Centro Calza Bini*, 17(2), pp.185-216

Hettema, J. and Egberts, L., 2019. Designing with maritime heritage: adaptive re-use of small-scale shipyards in northwest Europe. *Journal of Cultural Heritage Management and Sustainable Development*, 10(2), pp.130–143. <https://doi.org/10.1108/JCHMSD-04-2019-0032>.

Hussein, F., Stephens, J. and Tiwari, R., 2020. Cultural memories and sense of place in historic urban landscapes: The case of Masrah Al Salam, the demolished theatre context in Alexandria, Egypt. *Land*, 9(8), p.264.

Ikiz Kaya, D., Pintossi, N. and Dane, G., 2021. An Empirical Analysis of Driving Factors and Policy Enablers of Heritage Adaptive Reuse within the Circular Economy Framework. *Sustainability*, 13(5), p.2479. <https://doi.org/10.3390/su13052479>.

Kapyrka, J. and Migizi, G., 2016. Truth and Reconciliation in archaeology: Dismantling the kingdom. *Arch Notes*, 21(4), pp.3-9.

Gitiga Migizi and Julie Kapyrka 2015 Before, During, and After: Mississauga Presence in the Kawarthas. In *Peterborough Archaeology*, edited by Dirk Verhulst, pp. 127-136. Peterborough Chapter of the Ontario Archaeological Society, Peterborough.

KWIC, 2021. Prioritizing indigenous leadership to advance the SDGs in Nogojiwanong | Peterborough. Available at: <https://kwic.info/sites/default/files/2021-05/KWIC-Report-ILAT-WEB.pdf> (Accessed August 20, 2023).

Lak, A. and Hakimian, P., 2019. Collective memory and urban regeneration in urban spaces: Reproducing memories in Baharestan Square, city of Tehran, Iran. *City, Culture and Society*, 18, p.100290. <https://doi.org/10.1016/j.ccs.2019.100290>.

Lak, A. and Hakimian, P., 2019. Collective memory and urban regeneration in urban spaces: Reproducing memories in Baharestan Square, city of Tehran, Iran. *City, Culture and Society*, 18, p.100290.

Lanz, F., 2023. The building as a palimpsest: heritage, memory and adaptive reuse beyond intervention. *Journal of Cultural Heritage Management and Sustainable Development*. [online] <https://doi.org/10.1108/JCHMSD-06-2022-0106>.

Lynch, N. and LeDrew, R., 2022. Adaptations on the edge: post-secular placemaking and the adaptive reuse of worship spaces in Newfoundland. *Social & Cultural Geography*, 23(2), pp.309–329. <https://doi.org/10.1080/14649365.2020.1737961>.

Manganelli, B., Tataranna, S. and Pontrandolfi, P., 2020. A model to support the decision-making in urban regeneration. *Land Use Policy*, 99, p.104865. <https://doi.org/10.1016/j.landusepol.2020.104865>.

Mathews, V., 2019. Lofts in translation: Gentrification in the Warehouse District, Regina, Saskatchewan. *The Canadian Geographer / Le Géographe canadien*, 63(2), pp.284–296. <https://doi.org/10.1111/cag.12495>.

Mérai, D., Veldpaus, L., Pendlebury, J. and Kip, M., 2022. The Governance Context for Adaptive Heritage Reuse: A Review and Typology of Fifteen European Countries. *The Historic Environment: Policy & Practice*, pp.1-21.

Mısırlısoy, D. and Günçe, K., 2016. Adaptive reuse strategies for heritage buildings: A holistic approach. *Sustainable Cities and Society*, 26, pp.91–98. <https://doi.org/10.1016/j.scs.2016.05.017>.

Mohamed, R., Boyle, R., Yang, A.Y. and Tangari, J., 2017. Adaptive reuse: a review and analysis of its relationship to the 3 Es of sustainability. *Facilities*, 35(3/4), pp.138–154. <https://doi.org/10.1108/F-12-2014-0108>.

Nadin, V., Stead, D., Dąbrowski, M., & Fernandez-Maldonado, A. M. (2021) Integrated, adaptive and participatory spatial planning: Trends across Europe, *Regional Studies*, 55(5), pp. 791–803. doi:10.1080/00343404.2020.1817363.

Naima, B., 2021. Community-led initiatives for the rehabilitation and management of vernacular settlements in Oman: a phenomenon in the making. *Built Heritage*, 5(1), p.21. <https://doi.org/10.1186/s43238-021-00039-5>.

NAR, 2017. *Smart Growth - National Association of Realtors*. [online] www.nar.realtor. Available at: <<https://www.nar.realtor/smart-growth>> [Accessed 1 July 2023].

Nassar, D.M. and Sharaf Eldin, S., 2013. Towards adaptive reuse of the industrial heritage in Minet El-Bassal district at Alexandria. *Architecture and Planning Journal (APJ)*, 22(1), p.3.

Pintossi, N., Ikiz Kaya, D. and Pereira Roders, A., 2021a. Assessing Cultural Heritage Adaptive Reuse Practices: Multi-Scale Challenges and Solutions in Rijeka. *Sustainability*, 13(7), p.3603. <https://doi.org/10.3390/su13073603>.

Pintossi, N., Ikiz Kaya, D. and Pereira Roders, A., 2021b. Identifying Challenges and Solutions in Cultural Heritage Adaptive Reuse through the Historic Urban Landscape Approach in Amsterdam. *Sustainability*, 13(10), p.5547. <https://doi.org/10.3390/su13105547>.

Pintossi, N., Kaya, D.I., van Wesemael, P. and Roders, A.P., 2023. Challenges of cultural heritage adaptive reuse: A stakeholders-based comparative study in three European cities. *Habitat International*, 136, p.102807.

Rosenbaum, M.S., Kim, K. (Kawon), Ramirez, G.C., Orejuela, A.R. and Park, J., 2021. Improving well-being via adaptive reuse: transformative repurposed service organizations. *The Service Industries Journal*, 41(3–4), pp.223–247. <https://doi.org/10.1080/02642069.2019.1615897>.

Ruiz-Pérez, M.R., Alba-Rodríguez, M.D., Castaño-Rosa, R., Solís-Guzmán, J. and Marrero, M., 2019. HERVEEA Tool for Economic and Environmental Impact Evaluation for Sustainable Planning Policy in Housing Renovation. *Sustainability*, 11(10), p.2852. <https://doi.org/10.3390/su11102852>.

Shen, T., Yao, X. and Wen, F., 2021. The Urban Regeneration Engine Model: An analytical framework and case study of the renewal of old communities. *Land Use Policy*, 108, p.105571. <https://doi.org/10.1016/j.landusepol.2021.105571>.

Shiple, R., Utz, S. and Parsons, M., 2006. Does Adaptive Reuse Pay? A Study of the Business of Building Renovation in Ontario, Canada. *International Journal of Heritage Studies*, 12(6), pp.505–520. <https://doi.org/10.1080/13527250600940181>.

Statistics Canada, 2023. Consensus Profile, 2016 Census. Peterborough centre. Available at: <https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=POPC&Code1=0636&Geo2=PR&Code2=35&Data=Count&SearchType=Begins&SearchPR=01&B1=All&TABID=1> (Accessed September 7, 2023).

Trent University, 2023. 13 Historical Facts About Indigenous People in Peterborough Area. *The Experience: Cultural*. Available at: <https://www.trentu.ca/indigenous/experience/cultural/nogojiwanong-traditional-area> (Accessed September 3, 2023)

The World Bank, 2023a. *About | Tools for Urban Regeneration*. [online] World Bank. Available at: <<https://urban-regeneration.worldbank.org/about>> [Accessed 29 June 2023].

The World Bank, 2023b. *Urban Development - Overview*. [Text/HTML] World Bank. Available at: <<https://www.worldbank.org/en/topic/urbandevelopment/overview>> [Accessed 29 June 2023].

Vardopoulos, I., 2022. Industrial building adaptive reuse for museum. Factors affecting visitors' perceptions of the sustainable urban development potential. *Building and Environment*, 222, p.109391.

Vecchio, M. and Arku, G., 2020. Promoting Adaptive Reuse in Ontario: A Planning Policy Tool for Making the Best of Manufacturing Decline. *Urban Planning*, 5(3), pp.338–350. <https://doi.org/10.17645/up.v5i3.3188>.

Veldpaus, L., 2023. Planning reform and heritage governance. *Planning Practice & Research*, 38(3), pp.331-339.

Yazdani Mehr, S., 2019. Analysis of 19th and 20th Century Conservation Key Theories in Relation to Contemporary Adaptive Reuse of Heritage Buildings. *Heritage*, 2(1), pp.920–937. <https://doi.org/10.3390/heritage2010061>.

APPENDICES

Appendix A: Letter of Consent

[On department letterhead]

Participant Consent Form: Interviews

Project Title:

Adaptive Reuse of Historic/Heritage Industrial sites: A Case Study in Peterborough Ontario,
Canada

Principal Investigator:

Ama Pokuaa Boateng, Sustainability Studies, Trent University, amaboateng@trentu.ca, 705 559
9968

Supervisor:

Dr. Roger M. Picton, School of the Environment, Trent University, rogerpicton@trentu.ca 613
618 7406

This study is being conducted by the principal investigator, Ama Pokuaa Boateng under the supervision of Dr. Roger M. Picton. By examining current approaches to restoring heritage

structures, this study aims to identify possible benefits and challenges to conducting adaptive reuse in Peterborough.

Consent to participate in research

I, _____ (insert name), have agreed to participate in this study under these conditions:

- 1) I understand that the Trent Research Ethics Board has approved this research (file #28289).
- 2) I understand that my participation is voluntary and can withdraw from the interview at any time without consequences.
- 3) I accept participation as voluntary and I can opt-out from participating in answering questionnaires, also my data provided will be discarded if I decide to opt-out within the period of 15th January 2023 to the period 15th February 2023.
- 4) I understand that my involvement will consist of semi-structured interviews.
- 5) I understand that in any report on the results of this research, my identity will be anonymized by assigning me a unique code (e.g P1, P2, etc).
- 6) I understand that anonymized extracts from my interview may be quoted in the study.
- 7) I understand that given the nature of Peterborough as a small city, complete confidentiality cannot be assured despite being able to withhold their name/position.
- 8) I understand that I will not benefit directly from participating in this research.
- 9) I understand that I will have a copy of this consent form for my records.

Your signature below indicates that you understood the description provided and have had an opportunity to ask questions and my questions have been answered. A copy of this Consent Form has been given to me for my records.

Name of Participant

Signature

Date

Principal Investigator's Signature

Date

This study has been reviewed and approved by the Trent University Research Ethics Board with file number (28289). All questions and concerns can be directed to Jamie Muckle, Research Conduct and Reporting, jmuckle@trentu.ca.

A copy of this consent will be left with you, and a copy will be taken by the researcher.

Appendix B: Interview Guide

Semi-Structured Interview Sample Questions

Principal Researcher: Ama Pokuaa Boateng

Email: amaboateng@trentu.ca

Phone: 705 559 9968

Semi-Structured Interviews: Museums, Sustainability and Preservation of Heritage

My research examines the adaptive reuse of historical and heritage industries in Peterborough, Ontario. The questions will encourage you (respondents) to express your (their) opinions in the context of your (their) experiences and knowledge.

Although your contributions to this study are regarded as valuable, respondents are reminded that participation is voluntary and one can opt-out anytime during the time frame of the research.

A. Introductory Questions

1. How would you describe your role at _____?
2. What are some of your main duties?

B. The nature and kinds of structures being reused in Peterborough

1. What are the main kinds (nature) of structures reused in Peterborough?
2. What percentage falls within “heritage” or “historical”?
3. Is there any classification or consideration for sustainability when choosing structures?

C. The challenges involved in reusing old structures in Peterborough

1. What do you see as the main challenges in reusing old structure in Peterborough?
 - i. Are there policy related challenges?
 - ii. Zoning related challenges?
 - iii. Building code related challenges?
2. Have there been issues with environmental design?
 - i. In your view, why do you think this is?
 - ii. Can you think of an example where this was an issue?
3. Have there been issues with inclusive design?
 - i. In your view, why do you think this is?
 - ii. Can you think of an example where this was an issue?
4. Have there been issues with valuation and commercial viability?
5. What kinds of documentation or legal processes is required?
6. How has the current real estate climate affected adaptive reuse?

B. The best practices for regaining abandoned building into their usefulness

1. What has been the main strategy for reclaiming abandoned buildings in Peterborough?
2. What has been the most effective ways for reclaiming abandoned buildings?
3. How is evaluation of sites done after being identified?

4. Does regaining abandoned sites require any cultural considerations or obligations?
5. Do these obligations influence the nature of reuse or repurposing?
6. From your perspective who are some of the main stakeholders involved in heritage adaptive reuse in Peterborough?
7. Are stakeholders involved? Who are the primary stakeholders?
 - i. How is stakeholder engagement done in this process?

C. The initiatives of various stakeholders including public and private entities, aimed at restoring abandoned heritage structures

How would you describe your relationship with the City of Peterborough?

- D. Have you had difficulties with grants, funding, plan implementation and or regulation?
- i. What are the objectives set for these structures within the scope of sustainability?
 - ii. What collaborations are there between private and public institutions in regaining or restoring abandoned heritage structures?
 - Can you mention a few? Or provide any references (websites, activists/movements etc)?
 - iii. What initiatives have been implemented by your organization in the last 3 years?
 - iv. What structures and frameworks are in place to support these initiatives in the long term?
 - v. How have these initiatives contributed to sustainability goals within Peterborough/nationally/worldwide?
 - vi. Are there any municipal incentives available for the retrofit of buildings into new uses (e.g. tax incentives, heritage grants)?

In your view what else could be done to make it more affordable and / or attractive to engage in adaptive reuse?

Are you aware of any program available at the provincial or federal level to support adaptive reuse?