# Exploring Halifax's Industrial Heritage: The Williams Lake Historic Corridor

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## Summary

An industrial corridor used to follow Lawsons Creek, which flows from Williams Lake to the Northwest Arm, in Halifax, Nova Scotia. This site was actively used for a variety of manufacturing enterprises in the 18<sup>th</sup> and 19<sup>th</sup> centuries. Although the scale of these industries was small, they were representative of the activities that occurred in the Province at that time. Today, few physical traces remain of this industrial past, and the area is mostly undeveloped open space and low-density residential. There are no markers or signs on the corridor land acknowledging its industrial heritage and cultural significance. This research explores the natural and human histories of the study area, and its current situation and uses. These elements have been analyzed to identify possible themes and stories for a future interpretation plan, as well as opportunities and constraints for interpretation that should be considered. Possible interpretation media are also discussed and assessed for suitability. This information may be useful to interpreters and interested heritage or environmental groups in future interpretation endeavors for the area.

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## Introduction

Think of a museum that you may have visited recently, or perhaps a tour you may have taken. Did you come away feeling like you had learned something new, or like you were a little more connected to the place? Perhaps you felt some sort of strong emotion, pleasant or passionate, in reaction to the content experienced. If so, then you were a participant in effective interpretation.

Interpretation, pioneered by US National Park Ranger, Freeman Tilden, in his 1957 book *Interpreting our Heritage*, aims to help visitors appreciate a place, object, or event. Successful interpretation engages people by provoking them to give serious thought to the subject matter (Tilden, 1957). Often the goal is to help people understand why something is worth preserving (Carter, 1997).

Landscapes and their histories embody a sense of place, and are often vehicles for cultural values. They foster social cohesion by providing a platform for a common worldview and a shared identity (Hester, 2006). Many of a landscape's stories are not well documented in the annals of

history, which tend to favour grand events centred on powerful actors. The daily activities of the general populace are often neglected (Sandercock, 1998). Knowledge of these everyday histories is equally, if not more, vital in creating identity, however. These stories are relatable to people by virtue of their proximity, and act as a vector for community building by highlighting a shared past (Hester, 2006).

Williams Lake is situated on the fringes of Halifax. The Lake and its surrounding landscape's stories do not begin with recent development, however, but rather with industrial activity in the 1760s (Watts, 1994). Many of the physical traces of this past are not apparent today, nor are its



Figure 1: Location of historic industrial corridor

stories largely recorded. One such story is that of an industrial corridor that used to stretch along the creek flowing from Williams Lake to the Northwest Arm, including the immediately adjacent land of both of the creek's banks (Figure 1).

The majority of industrial activity occurred in the 19th century, and included ice-harvesting from Williams Lake, shipping, tanning, milling, and rock quarrying (near the corridor). Several prominent families—such as the Lawsons, the Jollimores, and the Yeadons—were the force behind many of the industrial activities. (Watts, 1994; Regan, 1978).

Today the area surrounding the industrial corridor is occupied primarily by low-density residential development. Municipal services end near the industrial corridor. There are scant physical remains of the corridor, although the Nova Scotia Yacht Squadron clubhouse (Figure 2) is partially constructed of scavenged material from an old sugar house (Raymond, M., personal communication, October 16, 2014). Many current residents of the area are likely unaware of this unique piece of

everyday history, as it is not widely discussed or celebrated. Apart from Watts' and Regan's books there is little published material on the activity in this area.

The Williams Lake end of the corridor abuts the urban wilderness of Purcell's Cove Backlands. Although privately owned, this area was designated as "Urban Reserve" by the 2006 Halifax Regional Municipal Plan, which prevents the area from being developed in the immediate future (Bousquet, 2014). Recently, landowners of the Backlands



Figure 2: Nova Scotia Yacht Squadron (Rodgers, 2012)

challenged this designation. The future of the area is currently undetermined, although there is talk of bringing the land into public ownership (Davenport, 2014). What can be done on the site in terms of interpretation will depend on the ownership of the corridor land.

It is important that residents and visitors to Williams Lake have the opportunity to connect with and understand this local past. Not only was this economically active corridor representative (on a small scale) of the industries that took place in Halifax (and perhaps the wider Province) and shaped the city, but understanding these everyday histories highlights a shared past and encourages community pride and identity.

The purpose of this study is to gather and document the important stories of the historic industrial corridor between Williams Lake and the Northwest Arm in Halifax, and to develop a plan to interpret them to the public in an engaging manner.

## **Literature Review**

Interpretation was formally delineated as a discrete subject of inquiry and practice roughly 70 years ago by Tilden, making it a relatively young field. After undertaking a review of the literature I discovered that theoretical frameworks have already been established, and a variety of research conducted.

This research will aim to apply these interpretation frameworks to the old industrial site around Williams Lake. "Industry" is a broad term that can connote a variety of things. In order to ensure a clear and focused area and time period for inquiry and interpretation in this study, it was important to have precise criteria for what sorts of activities will constitute "industry." A review of the literature helped me to establish a working definition of "industry" for the purposes of this study.

#### Defining interpretation

The crux of interpretation is the ability to translate complex ideas into a form that can be readily understood by the average person (Ham, 1992). It is important to distinguish between merely stating facts, and interpreting a place. As Tilden said, "[interpretation is an] activity which aims to reveal meanings and relationships through the use of original objects, by firsthand experience, and by illustrative media rather than simply to communicate factual information" (Tilden, 1957, p. 8). The aim of interpretation is to help visitors appreciate what is important about a place. Although Tilden was interpreting national parks, interpretation can be applied to many things. Culture, buildings, towns, historical events, objects, natural landscapes, industry, and activities are just a few examples (Carter, 1997).

#### Reasons for interpretation

Tilden's famous quotation of an anonymous park ranger, "through interpretation, understanding; through understanding, appreciation; through appreciation, protection," (Tilden, 1957, p. 38) is widely accepted as the core *raison d'être* of interpretation (Powell et al., 2012). While a conservation ethic is often at the heart of interpretation, several sources caution against blind and dogmatic preservation (Ford, 1984; Carter, 1997; Powell et al., 2012). The current context of a feature should be taken into account (Carter, 1997), and the goals of interpretation can be to raise awareness, knowledge, and visitor satisfaction (Powell et al., 2012), rather than to promote active conservation by visitors (Carter, 1997, p. 4). Interpretation may also foster a sense of community, identity, and belonging. Landscapes and other subjects of interpretation are often charged with cultural meaning or "sacredness" (Hester, 2006, p. 118), articulating a common worldview and helping communities to orient themselves in the present. Knowledge of a common past creates a sense of rootedness and may strengthen community identity and cohesion (Hester, 2006).

#### Theories of interpretation

In 1957 Tilden laid out six fundamental principles of interpretation. Three of these have carried forward into recent practice. First, interpretation should provoke thought about the content being interpreted. Second, interpretation should reveal a new insight about the subject of interpretation. (Carter, 1997; Nova Scotia Tourism, Culture and Heritage & Nova Scotia Museum, 2009). Finally, interpretation should relate to "something within the visitor, or else it is sterile" (Tilden, 1957, p. 8) (meaning that it will be ineffective). This last principle is perhaps the most important. The cognitive and social psychological machinations that occur when a person can "connect [information] to something already inside [her] brain" (Ham, 1992, p. 14) are significant to internalizing what is experienced.

The concepts of place-making and meaning-making are integral to effectively relating the object of interpretation to a visitor. Tilden hypothesized that the fullest appreciation of place and meaning manifests in visitors who imitate the experience being interpreted as closely as possible (Tilden, 1957). This approach aims to elicit an emotional response, and supports the idea of *feelings as interpretation*, a blurring of the traditional Western dichotomy of emotion and knowledge (Schorch, 2012). It is important to acknowledge the subjective and relative nature of epistemologies such as "place" and "meaning," however. An experience will mean different things to different people depending on their histories, worldview, and culture (Williams, 2014).

It is also necessary to critically examine the subjective and relative nature of interpretation itself, and to acknowledge the specific biases inherent in one's position as the interpreter. These biases manifest in whose history and stories are being told, and how (Williams, 2014). For example, history is often focused on the powerful and privileged classes; there is an absence of "all but white professional males as actors on the historical stage" (Sandercock, 1998, p. 8). This male-centred historical paradigm generally focuses on grandiose events to the exclusion of other contexts that were the domain of less influential demographics, such as home, neighbourhood, and community (Sandercock, 1998). Examining a topic on multiple scales, and in particular the larger context, is important in understanding the circumstances in which the object of interpretation occurred and developed (Martin, 2014).

#### Developing a plan

Carter suggests that making content relevant to the viewer hinges on skillful communication (Carter, 1997), organized around *themes*. A theme is the main point that the interpreter wishes to

communicate to visitors, around which individual stories (topics) are arranged. (Ham, 1992). I found the recommendation for using themes as an organizational tool in interpretation echoed almost universally across the literature that I reviewed (Carter, 1997; NS Tourism, Culture and Heritage & NS Museum, 2009; Tilden, 1957).

Knowing one's audience is vital to formulating an effective plan and selecting which narratives and themes to interpret (NS Tourism, Culture and Heritage & NS Museum, 2009). Determining the desired visitor outcomes will also help to shape the plan. Visitor outcomes are the responses and changes that a particular interpretation project aims to elicit or instill in the viewer, such as knowledge, or a change in behaviour. (Powell et al., 2012).

Visitor limitations, such as time, money, and the amount of information that a person can absorb at once (Tilden, 1957), should also be taken into account when creating a plan. Absorptive capacity is particularly significant; if visitors are overloaded with information, they may not retain important points. The first research to quantify the amount of information that a person can absorb at one time put the number at 7 + /-2 pieces of information (Miller, 1956). Subsequent research has placed the optimal capacity slightly lower, at 5 + /-1 pieces (Nagaya, 1996).

#### Methods and media

While there are many methods of interpreting content, the same basic principles and requirements are common to all. To communicate effectively, the method needs to get visitor attention, make the experience enjoyable, make the material relevant, and provide structure (Carter, 1997). The variety of interpretation media has increased significantly with the advent of new technology. More traditional forms include guided interpretation, information panels, visitor centres, publications (leaflets, newsletters, etc.), and multi-media (such as videos) (Carter, 1997). Recently, technologically-intensive media such as smartphones, GPS systems (Lamsfus et al, 2012), and podcasts (Henker & Brown, 2011) have also become widespread. Each method has strengths and weaknesses. For example, guided interpretation may be engaging, but it is expensive and resource-intensive (Carter, 1997).

While there is an abundance of research that discusses the effectiveness of specific interpretation methods, there are no universally recognized best practices in the field of interpretation (Powell et al., 2012). There is some evidence to suggest that different methods have disproportionate effects on various visitor outcomes, however (Powell et al., 2012), so the desired outcomes for the interpretation should be considered when selecting the media.

#### Defining industry

What constitutes "industry"? This is not a straightforward question, but a clear delineation of this concept is foundational to research whose objective is to document "industrial" activity. One finds a range of definitions. For example, Oxford Dictionary describes industry as "economic activity concerned with the processing of raw materials and manufacture of goods in factories" (Oxford Dictionaries, 2015); Merriam-Webster says that it is "systematic labor especially for some useful



Figure 3: Industry on the Arm, 1915

(Nova Scotia Archives, n.d.)

purpose or the creation of something of value" (Merriam-Webster, 2015); a third source calls it "the people or companies engaged in a particular kind of commercial enterprise" (Vocabulary, 2015).

The range of definitions reflects how perceptions of industry have changed over time. Today many people equate industry with mechanized mega-factories, but this a relatively recent phenomenon. Before the Industrial Revolution, the concept of industry was tightly bound to individual behaviours,

such as an "industrious" (hard-working, diligent) person (Galligan, 2009). Industry would have been applied to any number of agrarian activities, however small-scale, as well as to the basic manufacturing carried out in people's homes using hand-tools (History, n.d.). In the latter part of the 18<sup>th</sup> century, the term took on a new meaning; "industry" now referred to collective manufacturing and productive institutions (Williams, 1982). In his 1776 book, *The Wealth of Nations*, Adam Smith was one of the first writers to use capital "I" "Industry" (Williams, 1982); Industry had become an independent concept, rather than merely an adjective (Williams, 1982). The catalyst for this shift was the rapid emergence of new, ultra-productive manufacturing technologies that characterized the Industrial Revolution, and took place between the late-1700s and the mid-1800s (Galligan, 2009).

Manufacturing activity in the corridor occurred as early as the mid-1700s and intensified in the 19<sup>th</sup> century (Watts, 1994). Because this was before and during the emergence of the major technological advances of the Industrial Revolution, the scale and institutional aspects that now demarcate the modern understanding of "Industry" will be disregarded in this research. For the purposes of this project, "industry" will be defined as the organized and dedicated manufacture of some product, regardless of the scale of the operation, for the purpose of commercial enterprise. This definition aims to capture the unique, multi-faceted, and amorphous nature of industry in this period of transition.

#### Conclusion

Interpretation aims to provoke viewers into thinking about a subject in a different way. It may be conducted for a variety of reasons, such as encouraging preservation or constructing identity. There is a wide variety of research and theory, but a defined set of best practices remains elusive. Finally, the term "industry" has been clarified for the purposes of this project. The industrial corridor offers a local example of important historical Nova Scotian industries; although it was small, the activities that took place there may be representative of the activities of the region and Province. Using interpretation to bring this piece of culturally significant social and economic local history to the attention of both residents and visitors would add to the understanding of the history and identity of the area, and may help to inform land-use decisions and future land development.

## **Goal and objectives**

*Goal:* The goal of this study is to gather and document the important stories of the historic industrial corridor between Williams Lake and the Northwest Arm in Halifax, and to develop a plan to interpret them to the public in an engaging manner.

**Objectives:** 

- Determine and document the extent and location of the remains of the industrial corridor.
- Discover the significant stories of the corridor and determine major themes and connections.
- Understand the current context of the site and any opportunities and constraints for interpretation.
- Recommend appropriate methods for interpretation.

## Approach

I conducted my research using a general inductive approach. This approach involves using specific project objectives (above) to determine the domains and areas of investigation and data collection. Collected raw data is analyzed in a "goal-free" way (Scriven, 1991, p.56), meaning analysis is without the constraints of a preconceived hypothesis, theory, or model; rather, findings stem directly from the raw data (Thomas, 2006). Corbin and Strauss perhaps best illustrate the essence of this approach when they say, "The researcher begins with an area of study and allows the theory to emerge from the data" (Corbin and Strauss, 1998, p.12).

In the inductive approach, findings are inevitably shaped by the data interpreter's (researcher) own assumptions, prejudices, and past experiences (Thomas, 2006). It is thus necessary for the researcher to reflect on and make clear her values and beliefs as they relate to the research topic. My personal experience growing up in a city with plentiful park space and easy access to the

wilderness of the Rocky Mountains instilled an interest in environmental conservation in me from an early age. These values lead me to pursue post-secondary studies that aligned with my environmentalist worldview. My Community Design program emphasized place-based planning practices that are sensitive to the form and limitations of the landscape. My second major, in Sustainability, reinforced this attentiveness to the natural environment. Reflecting on these long-held environmental values, which have been further cemented by my education, I recognize that they have partially directed my research focus, data analysis, and interpretation recommendations in this project.

My Community Design program was also situated in Halifax, Nova Scotia, a city that is considered one of the most historically rich in Canada. While recognizing the value of new urban development, the program tended to stress heritage conservation themes. This historically-oriented worldview has shaped my interpretation of the collected data in this research, and influenced my perceptions of how historical remains should be preserved and valued.

### **Methods**

In order to create an interpretation plan for the historic industrial corridor, a variety of data was collected, analyzed, and synthesized. My report presents the stories of the corridor and provides interpretation recommendations. This section details the specific methods that were used in this process.

#### **Data collection**

I collected qualitative data in multiple stages. I gathered an array of information, ranging from personal narratives, site visits, GIS data, municipal policies, archival material, and newspaper articles. I gathered data at multiple scales (the individual site and the larger, municipal, provincial, or national context) and timeframes (the time period when the industrial corridor was in operation to the present day). The specific data collection phases are discussed below in detail.

#### Focus Group

I facilitated a small focus group of three people to discuss the industrial corridor. Specifically, I wanted to determine the location of physical remains and to discover any undocumented stories. Dalhousie University required that I complete an ethics review before conducting the focus group. I downloaded the research ethics form from the University website, and after completing it submitted the form to the research board for review. After receiving feedback on my submission and making the requisite changes I was given permission to proceed with the focus group portion of my research.

There was no publicly available listing of people with this knowledge, so potential participants were recruited using snowball sampling, whereby already known potential participants suggested other possible participants from among their acquaintances (Bouma et al., 2012). Organizations that might be knowledgeable about the corridor were also approached. These organizations included the Williams Lake Conservation Company (WLCC), the Backlands Coalition, and Industrial Heritage Society of Nova Scotia.

Once possible participants were identified, I invited them to participate in the study, and included details on the purpose, duration, and requirements. Qualifications for participation in the focus group were to have knowledge of the Williams Lake historic industrial corridor, and consent to be audio recorded during the focus group. When a potential participant expressed interest, she or he was sent an informed consent document.

The focus group met for two hours in a reserved conference room in the Captain William Spry Community Centre near the corridor. As the facilitator I guided the conversation using prepared questions to ensure that the conversation stayed on topic, and I recorded the session using audio software. A map of the industrial corridor area was brought for participants to mark out significant areas or remains. Refreshments were provided, and to thank them for their participation each participant received a \$10 gift card to Tim Horton's at the end of the session.

#### Physical elements of the site

I conducted several site visits with knowledgeable local residents, and recorded my observations using photography and written notes. I also used GIS data to conduct an environmental inventory, and documented the site's underlying geology, topography, and other environmental conditions.

#### Historical elements of the site

An inductive content analysis (Thomas, 2006) was conducted on a variety of secondary sources, such as archival materials, books, and old news articles. Inductive content analysis involves reading collected raw data in detail, multiple times, and then sorting the information into broad and recurring categories (Thomas, 2006). From these categories, key themes and findings emerge. This analysis gathered information on the broader social, political, and economic contexts that the corridor developed and existed in, and examined how these contexts shaped or influenced the corridor. The Nova Scotia Archives and the Mainland South Heritage Society were sources, and I also inquired with relevant organizations (WLCC, Halifax Field Naturalists, Industrial Heritage of Nova Scotia) to see if they had any material.

#### Current condition of the site

To determine the current political, social, and economic contexts of the area, focus group participants were asked to describe their understanding of—among other things—recent events, local politics, and the current uses of the corridor land. In addition to this, the online content of local media outlets was examined for recent articles concerning the area. Relevant municipal policies were reviewed for pertinent information, and GIS data was used to determine ownership and zoning.

#### Interpretation methods

To explore interpretation media possibilities, I consulted various secondary sources. I examined case studies of interpretation, authoritative interpretation planning manuals such as Carter's handbook, as well as scholarly research that critically assesses interpretation methods and attempts to define overarching best practices. I conducted field visits to interpretative sites in HRM of a similar scale to the study area, and observed and reported the type of media used and its effectiveness using photography and notes.

#### **Data Analysis**

#### Physical remains

Using information from the focus group, site visit, and GIS data, I created maps of the site. These maps document the activities that took place on the land, and highlight physical remains and important features. Together, these maps illustrate the evolving nature of the site. See Appendix A.

#### Stories and themes

I listened to the audio recording of the focus group and took notes on important points. In conjunction with the information gathered from my content analysis of historical secondary sources, I identified overarching common themes. Once I determined major themes, I selected individual stories and arranged them to create a purposeful narrative of the area.

#### Opportunities and constraints to the site

I used data collected from all sources to determine any significant opportunities or constraints to interpretation of the site. Opportunities are features that contribute to effective interpretation, such as maintained trails that would facilitate movement around the site. Constraints may present a barrier to (certain) interpretation, such as a lack of internet service, which would preclude some technological methods. Interpretation opportunities and constraints may be physical, ownership-related, legal, economic, or social.

#### Appropriate interpretation methods

Information gathered from the literature, case studies, and visits to other interpretive sites was used to determine what sorts of media would be most effective for the industrial corridor.

### **Synthesis**

The products of the data analysis were synthesized into a report documenting the history of the industrial corridor and its current situation. Interpretation media were recommended by assessing the most appropriate methods (determined above) against the site's identified constraints and suggested interpretation themes. Recommendations are presented in a table format.

## **History**

### **Natural History**

Even though it has been altered through development, the environment is the matrix that originally dictated what sort of activity could take place on the corridor site. To fully understand the historic industrial corridor, it is first necessary to understand its natural history.

#### Bedrock.

The industrial corridor lies close to the contact zone of two bedrock formations. While the site is underlain by the Halifax Formation Slate of the Meguma Group, South Mountain Batholith leucomonzogranite is located just to the south (Figure 4).

The Halifax Formation bedrock was formed 495 million years ago in the Cambrian-Ordovician period (Karrow & White, 1999), around the time when fish and land plants developed (Atlantic Geoscience Society, 2001). This medium-strength formation is composed of black slate



Figure 3: Bedrock geology underlying the corridor

interspersed with metasandstone beds (Karrow & White, 1999). Halifax Formation slate frequently contains high concentrations of pyrite and pyrrhotite. When exposed to oxygen and water these minerals oxidize to produce sulphuric acid (Karrow & White, 1999), which poses several environmental risks. Acid drainage may enter groundwater and contaminate wells (HRM, 2011); it may also infiltrate aquatic ecosystems, destroying habitat and killing organisms (HRM, 2011).

The South Mountain Batholith granitoid is harder than the slate, making it relatively erosionresistant and difficult to excavate (Karrow & White, 1999). This formation is slightly younger than the Halifax slate. It originated 362 million years ago in the Devonian-Carboniferous period (Karrow & White, 1999), coinciding with the emergence of the first trees and amphibians, as well as the formation of the super-continent Pangea (Atlantic Geoscience Society, 2001). Radon-a colourless, odourless gas derived from the radioactive decay of uranium—is a potential hazard associated with granite bedrock (Karrow & White, 1999). While harmless in the open air, radon can become a health



Level 1 - Areas more likely to have groundwater containing a level of uranium approaching or exceeding the acceptable level of 0.02 mg/L according to Health Canada's Guidelines for Canadian Drinking Water Quality. These areas may also have elevated levels of radionuclides related to uranium such as radon, lead<sup>210</sup> and radium. Based on the presence of geological bedrock known to contain occurrences of uranium as well as numerous confirmed instances of elevated levels of uranium in groundwater.



Level 2 - Areas less likely to have groundwater containing elevated levels of uranium. However, though the instances of groundwater with elevated levels of these radionuclides are less common, there are still exceedances to Health Canada's Guidelines known to occur.

Figure 4: Potential for Uranium and related radionuclides in groundwater

#### Map excerpt from O'Reilly et al., 2009.

location of South Mountain Batholith. The Figure 5 map is both based on older data and is at a small scale (the full map depicts the entire Province); both are factors that may compromise the map's accuracy. It is also possible that the presence of granite-derived till (rather than bedrock) is why the area is categorized as "Level 1" in Figure 5. Alternatively, the site's close proximity to the South Mountain Batholith (Figure 4) may be enough to put it an increased risk for radon contamination.

#### Topography

The site and its surroundings are generally hilly (Figure 6); the land is steep to the south of the corridor and gently sloping to the north. Williams Lake is at an elevation of about 19 metres above

concern when concentrated in confined spaces such as basements or wells (Karrow & White, 1999). According to the Nova Scotia Natural Resource Department's radiometric map, which estimates the potential for uranium contamination in the groundwater of an area (Figure 5), the site is situated in a high-risk zone. There are several possible explanations for the discrepancy between Figure 4 and Figure 5 regarding the

sea level. The surrounding hills range in height from approximately 30 metres to 50 metres above sea level.

The ice of the last glaciation, during the Tertiary period, retreated 15,000-12,500 years ago, and revealed the underlying bedrock in some places, although till persisted in parts of the study area (Atlantic Geoscience Society, 2001). The varied topography of the site reflects the irregular undulations of the underlying South Mountain Batholith granite outcrops and the highly folded Halifax slate (Hill & Patriquin, 2014). The differential rates of erosion between the hard granite and the softer slate may also have contributed to the uneven nature of the terrain over time (Karrow & White, 1999).



Figure 5: Topography surrounding the site

Additionally, the Northwest Arm fault runs parallel to Lawsons Creek, just to the north (Karrow & White, 1999). The regional strike-slip fault system to which it belongs is also thought to influence topography in the area, promulgating the formation of harbours (Karrow & White, 1999), such as the cove where Lawsons Creek empties into the Arm.



Figure 6: Slope profile for Lawsons Creek, 2x vertical exaggeration

#### Figure by Rachael Nicholls

The slope down which Lawsons Creek runs (Figure 7) is a smooth, shallow S-shaped curve (Marsh, 2005). This form is generally a sign of long-term slope stability, and frequently occurs in coastal areas where there is vegetative cover to prevent heavy erosion (Marsh, 2005). Underlying consolidated materials, such as bedrock, also act as stabilizing features (Marsh, 2005).

#### Surficial Geology



Figure 7: Surficial geology surrounding the corridor

There is scant surficial material in the surrounding area (Figure 8), the last glaciation having eroded most of the sediment down to the bedrock (Karrow & White, 1999). The glaciers did leave some till deposits, however. The most notable glacial-landforms are the many drumlin hills that dot the Halifax region (Karrow & White, 1999). These silty till drumlins are composed of up three different tills (Utting, 2011). The core of the drumlin may be a basal Hartlen Till (Karrow & White, 1999), although this is found only in coastal drumlins (Utting, 2011). Hartlen Till is greyish, clayey, and compact, and was deposited in the earliest phases of the last glaciation (Karrow & White, 1999). This core is covered by Lawrencetown Till, a less compact, reddish, muddy till (Karrow & White, 1999). Occasionally, some drumlins also have a top layer of Beaver River Till, which exhibits a sandy matrix (Utting, 2011). The closest drumlin to the industrial corridor lies just to the south. It is a distinctive feature in the mostly-bedrock area. Its major axis runs southeast, parallel to the ice flow of past glaciers (Hill & Patriquin, 2014).

Other surficial geology features in the vicinity of the site are till blanket, till veneer, alluvial sediment, and anthropogenic forms. The till blanket and till veneer are both composed of Beaver River Till (discussed above), the distinguishing feature between them being the depth of the till (Utting, 2011). In the till blanket (along the coast to the north of the corridor), the material is thick enough (5-10 metres) to disguise the undulations of the bedrock (Utting, 2011). The till veneer immediately to the north of the corridor site, on the other hand, is much thinner (0.5-5 metres) and may not entirely disguise the underlying bedrock (Utting, 2011). Alluvial sediments are deposited by streams and rivers. Lawsons Creek has created a bed of deposits, which is composed of gravel, sand, silt, and organic materials (Utting, 2011). Finally, anthropogenic material may be artificial or geological, and vary in material—its defining feature is that it has been disturbed and influenced by human activity (Utting, 2011). This surficial form covers most of Mill Cove on the Arm.



Figure 8: Aspect of the corridor and area

Lawsons Creek flows down a shallow valley running west (from Williams Lake) to east (to Mill Cove on the Arm) (Figure 9). The creek valley has a primarily eastern exposure. East-facing terrain is generally cooler, as it receives its sunlight when the air temperatures are the lowest, in the morning (Marsh, 2005). The north-facing hill to the south of Lawsons Creek is also prone to cold temperatures. This slope is shrouded in shadow for all of the day during the winter. The subsequent accumulation of ice and snow (Marsh, 2005) can lead to hazardous footing, or limit accessibility along the creek valley entirely, as can be attested from a site visit in January. The south-facing slope that borders the creek is less prone to ice buildup (Marsh, 2005), and may still be traversable in the winter.

#### Ecodistricts

In the Nova Scotia Department of Natural Resources' classification system, the study area is located in the ecodistrict of St. Maragaret's Bay (Figure 10). This ecodistrict is characterized by a moist, rainy climate, with little droughtiness (Neily, P., personal communication, January 28, 2015). Soils are relatively shallow, well-drained stony sandy brownish loams that developed on granite till (Hill &



Figure 9: Ecodistrict

Patriquin, 2014). The soils are acidic and generally poor for farming (Soucoup, 2014), with a gravelly texture and areas of exposed bedrock also limiting machine operability (Neily, P., personal communication, January 28, 2015).

Red spruce stands dominate the slopes of this ecodistrict, with hemlock and black spruce on the lower slopes near watercourses and in poorly drained soil (Neily, P., personal communication, January 28, 2015). White pine are common where there are shallower soils and exposed bedrock (Neily, P., personal communication, January 28, 2015). Shade tolerant mixed-wood stands are present in a limited fashion, mostly on the deeper and well-drained soils of the drumlins (Neily, P., personal communication, January 28, 2015).

The high variability of topography and depth of soil and till creates microclimates in the industrial corridor site (Hill & Patriquin, 2014). These dispersed microclimates induce a vegetation

mosaic pattern, with each plant species growing in patches in its preferred microclimate (Hill & Patriquin, 2014). The vegetation in most of this area reflects the high stress environment created by the stony, shallow, nutrient-poor, acidic soil (Hill & Patriquin, 2014). The area supports rare plant species such as Mountain Sandwort, Golden Heather, and Lesser Brown Sedge, which cannot outcompete other species in more fertile conditions (Hill & Patriquin, 2014). Broom Crowberry, a shrub that is becoming increasingly threatened outside of Nova Scotia, also grows in the area (Hill & Patriquin, 2014). The nutrient-rich soil of the drumlin adjacent to the Royal Nova Scotia Yacht Squadron, however, is covered in a blanket of tall, healthy tree species (Hill & Patriquin, 2014.) The vegetation is also reflective of the fire-prone nature of the landscape, discussed in the next section.

#### Forest fire-prone landscape

The combination of topography, soils, and climate makes the area a fire-vulnerable landscape, with a long-term fire regime (Hill & Patriquin, 2014). It is estimated that there have been wildfires in the study area for upwards of 1,250 years (Hill & Patriquin, 2014). These fires have played a significant role in shaping the area's vegetation profile (Museum of Natural History, 1996). Species such as Broom Crowberry and Jack Pine are completely dependent on a cyclical burn-growth wildfire pattern (Hill & Patriquin, 2014). Red oak and red maple are prominent on the drumlin located just to the south of the corridor, and are part of the intolerant deciduous forest-type that thrives in deep soils in the early after-math of a fire (Museum of Natural History, 1996). Red oak in particular benefits from understory fires (Museum of Natural History, 1996). These low-intensity surface fires allow the oak to thrive in high fertility environments (such as the drumlin) by checking the growth of smaller seedlings that may compete with the tree (Museum of Natural History, 1996).

Other, more fire-sensitive species, are noticeably absent from the industrial corridor. This is likely due to a large fire that scorched the area in 1966 (Hill & Patriquin, 2014). For example hemlock, which is characteristic of the St. Margaret's Bay ecodistrict, is slow to recover after a fire. Hemlock does not occur in the immediate vicinity (Hill & Patriquin, 2014). It does grow in areas close by however, towards the western portion of Williams Lake where the landscape has not been as recently or severely ravaged by fire (Hill & Patriquin, 2014).

#### Hydrology

The corridor is part of the larger Williams Lake watershed (Hill & Patriquin, 2014), which was shaped by ancient glacial action (Karrow & White, 1999). The rocky and relatively impenetrable terrain produces large volumes of run-off after precipitation events (Hill & Patriquin, 2014). Some

of the run-off infiltrates into the ground, where it is filtered by the soils and surficial material before flowing into Williams Lake (Hill & Patriquin, 2014). This rapid filtration action removes the organic matter and sediments that produce humic acid (WLCC, 2014). Humic acid is the compound responsible for the dark brown colour of many of the lakes in this area, particularly those that receive their water supply slowly from bogs and swamps, where the water accumulates a high concentration of organic matter (WLCC, 2014). This lack of organic material is why the water in Williams Lake is clear (WLCC, 2014), and also why it is a low-nutrient environment (Museum of Natural History, 1996). As a result it is classified as an oligotrophic lake, meaning that it is a lowproductivity ecosystem (Museum of Natural History, 1996).

The increase in impervious surface area that has accompanied development in the area has consequences for run-off action and contamination (Marsh, 2005). This urban run-off is not filtered by the surrounding ecosystem before draining into the Williams Lake, and may introduce nutrients and contaminants that threaten its oligotrophic ecosystem by allowing increased plant and algae growth in the currently clear waters (Hill & Patriquin, 2014).

*Coastal Environment* The industrial corridor is located at the coast, where Lawsons Creek empties directly into Mill Cove in the Northwest Arm. The Arm reaches depths of up to 20 metres at its midpoint (Figure 11).



Figure 10: Bathymetry of the Northwest Arm

Map excerpt from Fader & Miller, 2008

Semidiurnal tidal variation causes this depth to fluctuate by 1.5-2.1 metres (Karrow & White, 1999). Forbes et al. estimate that sea level could rise as much as 4.4 metres around the Halifax peninsula in the coming decades, mainly as a result of melting ice caps and land subsidence (Forbes et al., 2009), threatening coastal structures and development at lower elevations. Storm surges also impact coastal environments (Marsh, 2005), and the lower part of the industrial corridor (around the Royal Nova Scotia Yacht Squadron clubhouse) may be vulnerable to such events.

#### Conclusion

Some of the most notable natural characteristics of the corridor site are the exposed rock terrain and variable topography, its fire-proneness and the adapted vegetation, its coastal location, and Williams Lake's oligotrophic state. These factors influenced human use of the land in the past, and will become more significant as we examine the industries that took place on the corridor.

#### Human History (Mid 1700s – Early 1900s)

#### A. The macrocosm: An overview of the history of Nova Scotia and Halifax

While this research is focused on the micro-scale of the Williams Lake industrial corridor, the broader historical context of Nova Scotia and Halifax were fundamental to the activities on the site. This section will present the social and economic history of Halifax and Nova Scotia during the period as the backdrop when industrial activities would have taken place on the Williams Lake site. This spans roughly the time from Halifax's establishment by the British military in the mid 18th century, to the city's industrial decline in the early 1900s. These events are presented in the timeline included on page 49.

#### European settlement (1749 - 1754)

In 1749, Edward Cornwallis, a British military officer, sailed into the Harbour and established Halifax town (Karrow & White, 1999) to counter the French military presence in Louisbourg, Cape Breton (Karrow & White, 1999), as well as the Catholic presence of the Acadians (McCann, 2015). The town's geological features were ideal from a military standpoint. The deep, ice-free harbour; the view afforded by the peninsula's drumlin hills; and the easily defensible narrow-mouthed harbour approach made it an ideal site to establish a military base (Karrow & White, 1999). Additionally, the British wanted to exploit the extensive cod populations in the area (McCann, 2015).

Cornwallis brought with him 2,500 settlers (McCann, 2015) with the goal of cultivating the land for the garrison at Halifax (Soucoup, 2014). The soil was poor for farming, however, and few houses for the settlers were completed before the onset of winter; many people died, and there was a subsequent exodus by the survivors to Boston and other places in America (McCann, 2015).

#### The Expulsion of the Acadians and the Seven Years War (1755 - 1763)

The British regarded the Acadians as a threat for two reasons. First, the Acadians were friendly with England's enemies, the French and the Native Americans (Soucoup, 2014). Second, the Acadians refused to swear allegiance to the British Crown (Soucoup, 2014). To eliminate this perceived threat, the British deported an excess of 6,000 Acadians from their homes in the Annapolis Valley in 1755 (CBC, 2015). Many of them ended up dispersed throughout the Thirteen American Colonies, while others managed to flee to Quebec or into what is now New Brunswick (CBC, 2015).

Shortly after the Expulsion, the conflict between the British and the French in Louisbourg escalated, culminating in the Seven Years War (1756-63) (Soucoup, 2014). Halifax, as the primary base for launching attacks against Louisbourg, prospered in the throes of a wartime boom (Soucoup, 2014). The British victory in 1763 effectively eclipsed all French influence in the region (McCann, 2015). With the termination of the war also came a halt to the flow of British money, and Halifax experienced a 50 percent decrease in population (Soucoup, 2014).

#### The American Revolution (1765 - 1783)

In 1765 the British government imposed the Stamp Act upon the American Colonies. The Act levied a tax upon every printed sheet of paper used in the Colonies (Colonial Williamsburg, n.d.). This legislation amounted to taxation without consent, and raised the ire of the colonists, a sentiment that was echoed in Halifax due to its high population of American residents (Soucoup, 2014).

Peace prevailed, however, and 1767 witnessed an influx of New Englanders to Nova Scotia (Soucoup, 2014). These newcomers settled and commenced farming the fertile lands of the banished Acadians, located in the modern day Annapolis Valley (Soucoup, 2014). At this point, almost half of Nova Scotia's population was composed of settlers from the Boston colonies (Soucoup, 2014).

In 1773, the replacement of the reviled Stamp Act with the more inflammatory Tea Tax sparked the American Revolution (1775-1783) (Soucoup, 2014). Given its high American population, there was initially some question as to whether Nova Scotia would join the Thirteen Colonies in rebellion (Soucoup, 2014). Halifax was quickly flooded with British military troops, however, foreclosing the possibility of an uprising (McCann, 2015).

Halifax once again reaped the fruits of wartime prosperity, experiencing a boom as it supplied the British military vessels with timber and provisions (Soucoup, 2014). With the British defeat in 1783, Nova Scotia was the destination of Loyalists fleeing the American colonies (McCann, 2015). Overcrowding and food scarcity became a problem (Soucoup, 2014). The end of the war also signaled the end of frequent British visits, and Halifax's economy entered a period of quiescence (Soucoup, 2014).

#### The French Revolutionary Wars and The Napoleonic Wars (1789 - 1815)

After the French Revolution in 1789, the new Revolutionary government embarked on a path of international conflict, beginning in 1792 (Schneid, 2011). Known as the French Revolutionary Wars (1792-1803), this period of fighting would progress into the Napoleonic Wars (1803-1815), cumulatively producing more than twenty years of conflict (Schneid, 2011).

Britain was one of the nations at almost constant war with France (Schneid, 2011). As a colony of Britain, Nova Scotia experienced the ripples and waves of this turmoil, particularly because Halifax was often used as an active military base. British supremacy of the seas allowed her to police trade from America to Europe, effectively placing an embargo on the shipping of American goods to France (Landry, 2009). American ships seized by the British Navy that were thought to be carrying goods bound for France were often sent to Halifax (Landry, 2009). Many a Halifax merchant became wealthy through the re-shipment of American merchandise to Europe (Soucoup, 2014). In response to a 1794 spike in fighting with the French, Prince Edward, who had been appointed commander of the Halifax garrison, refurbished Halifax's military infrastructure (Soucoup, 2014). War once again bolstered the Halifax economy, as Britain relied heavily upon the colony for supplies of timber and other resources (McCann, 2015).

Despite this prosperity, hardship struck in the bitterly cold winter of 1795-96. A constant lack of provisions pushed Halifax to the verge of famine. Flour, in particular, was in short supply, and the city's governor banned its cosmetic use as hair powder in order to conserve the precious food (Raymond & Watts, n.d.). In 1976, fears that the French would conduct an attack on Nova Scotia were stoked when ports in Newfoundland were raided (Landry, 2009).

Napoleon ascended to dictatorial power in 1799. This change of leadership did not dampen France's appetite for international conflict, in which Britain continued to be an active participant (Landry, 2012). Except for an 18-month pause of peace in 1801, the fighting would continue unabated until 1815 (Landry, 2009).

#### The War of 1812 (1812 - 1815)

Although they are considered two separate conflicts, the Napoleonic Wars had sown some of the seeds that eventually blossomed into the War of 1812. The War of 1812 between fledgling America

and Britain occurred simultaneously with the last years of the Napoleonic Wars (Landry, 2009). The Americans, tired of the many years of British-enforced trade blockades (a strategy to weaken her enemy, France) and routine seizures of mercantile ships bound for Europe, felt that the British did not acknowledge their position as a sovereign nation (Government of Canada, 2013). America, embroiled in constant conflict with its Native American population as settlers continued to push westward, also suspected the British of supplying the Natives with weapons to aid in their resistance (Government of Canada, 2013). In June 1812, America declared war on England, with the objective of annexing central and eastern Canada (Government of Canada, 2013).

Although Britain had a long history of naval supremacy, the many years of conflict had taken their toll on the British forces, and resources were stretched thin (Landry, 2009). Halifax was used as a base for the British Navy from which to maintain blockades of many American ports (Government of Canada, 2013). While the Navy effectively held and defended Nova Scotia, they suffered a considerable number of ship-to-ship defeats at the hands of the Americans (Landry, 2009).

Piracy and privateering also played a significant role in this conflict. Atlantic Canadian merchants and fishermen were granted permission by the English authourities to attack enemy merchant traders and to seize their bounty (Government of Canada, 2013). Many Nova Scotians made their fortune from these privateering activities (Government of Canada, 2013).

Throughout most of the War of 1812, the British were splitting their resources between battling Napoleon on one side of the Atlantic, and the Americans on the other (Government of Canada, 2013). With Napoleon's initial abdication of the throne in 1814 (Schneid, 2011), the possibility of reinforced British troops precipitated an American willingness to enter peace talks (Government of Canada, 2013). The Treaty of Ghent was ratified in 1815; the Treaty brought both the cessation of war and the cessation of Halifax's booming wartime prosperity (Soucoup, 2014). However the economy did not decline as much as might have been forecasted, and the British continued to occupy Halifax as their main outpost in North America (Landry, 2011).

#### Post-war and the Early Victorian Era (1816 - 1860)

After 1815, waves of European immigration, largely from Scotland and Ireland, inundated Nova Scotia. This lead to challenges characteristic of rapid population growth, such as shortages of food and housing (Soucoup, 2014). The lack of arable land, most of which was already occupied by previous diasporas, for immigrants to settle on further aggravated these problems (Landry, 2011). In the 1840s, tenant dwellings for immigrants were constructed around Citadel Hill, making the downtown less desirable for the Halifax elite and precipitating the establishment of lavish estates on the Halifax side of the Northwest Arm (Soucoup, 2009).

Despite this, the post-war and early Victorian ages were generally peaceful and modestly prosperous times, marked by the emergence of new technologies and trading activities. The early 1820s saw the paving of roads in Halifax, facilitating and enabling land transportation (Landry, 2011). As for water travel, steam ship use became widespread in the 1830s, expediting ocean shipping (Landry, 2011). The first steam railway in the Province was laid in 1839, but a viable network did not coalesce until the 1850s (Landry, 2011). A gold rush in the early 1860s, around Tangiers on Nova Scotia's eastern shore, also pumped fresh economic life into the Province (Landry, 2011).

After the War of 1812, trading with the Americans picked up, and in 1854 the Reciprocity Treaty was signed (Soucoup, 2014). The treaty allowed Nova Scotian timber, fish, and agricultural products tariff-free entry into America (Soucoup, 2014). There was some discontent because the agreement also stipulated that the Province would relinquish its exclusive rights to the fisheries just off of its coast (Landry, 2011). Nonetheless, the uninhibited ability to sell a diverse array of other commodities to the large American market gave a boost to the Nova Scotian economy (Soucoup, 2014).

#### The American Civil War (1861 - 1865)

During the American Civil War, relations between the northern states (the Union) and Britain were tense enough for Britain to justify sending troops to fortify Halifax in case of an American attack (Soucoup, 2014). This influx of troops stimulated the Halifax economy. The Union imposed a trade blockade against the southern states (the Confederacy), providing a lucrative opportunity for enterprising Nova Scotians (Soucoup, 2014). Many merchants prospered by shipping supplies to both the Union states, and past the embargo to the Confederacy (Soucoup, 2014). The end of the Civil War brought about the usual peacetime economic slump for Halifax and marked the end of free trade with the Americans (Soucoup, 2014).

#### Confederation (1866 - 1867)

The British government began to promulgate the notion of the amalgamation of its North American colonies, wishing to be relieved of the burden of defending them (Soucoup, 2014). The largest motivator of this proposition was the fear of American expansion and aggression (Landry, 2011). During this period, Nova Scotia's economy was flourishing, thanks to vibrant shipbuilding, farming,

and fishing industries (Tattrie, 2014). Joseph Howe, a prominent Nova Scotia politician, opposed the Province joining Canada. He voiced fears that the small Province would wither as part of a larger country, and that it was too culturally and geographically removed from the other amalgamates (Tattrie, 2014). Despite widespread opposition throughout Nova Scotia, the Province's political leaders agreed to join Confederation (Tattrie, 2014). Ongoing fears of their neighbour to the south, promises of expanded trade markets, and a caveat that the Intercolonial Railway (linking the Maritime colonies to the rest of Canada) would be completed, were all factors in this decision (Landry, 2011). Thus, amidst much doubt and controversy, four provinces (Nova Scotia, New Brunswick, Quebec, and Ontario) entered into Confederation in 1867 (Landry, 2011).

#### Industrialization (1868 - early 1900s)

With the decline of the wooden shipbuilding industry in the 1880s in the face of widespread steamship technology (Sager & Fisher, 2007), Nova Scotian capitalists began to invest in other industries (Soucoup, 2014). The Dominion government completed the Intercolonial Railway from Nova Scotia to continental Canada, in 1876, which opened up opportunities for the expedient shipping of goods (Soucoup, 2014). In 1879, the Dominion enacted legislation introducing a tariff on foreign-manufactured items, but allowing raw materials to enter Canada duty-free (Soucoup, 2014). This lead to a spurt of growth in industrial manufacturing in Nova Scotia, with products cheaply shipped via rail, and sold in Upper Canada (McCann, 2015). Industries such as a cotton factory, sugar refineries, foundries, and printing companies soon proliferated in Halifax and Dartmouth (McCann, 2015).

#### Decline of industry (early 1900s)

The dreams of industrial prosperity were short-lived (McCann, 2015). A number of factors allowed Upper Canada to out-compete the small Province of Nova Scotia. Low-priced goods produced by the larger-scale operations of Ontario and Quebec filled rail cars returning to Nova Scotia (Soucoup, 2014). Intra-provincial over-production was also an issue, with products from the many industries flooding the small Nova Scotia market (Soucoup, 2014).

#### Conclusion

Nova Scotia, and specifically Halifax, has one of the oldest post-European settlement histories in Canada. This history is fraught with conflict, interspersed by periods of relative calm and peace. This boom-bust cycle of war, as well as the rapid emergence of new technologies that characterized the 19th century, had a profound influence in shaping the city and the Province's development and industrial activities.

#### B. The microcosm: Activities of the Williams Lake historic industrial corridor

The historic industrial corridor that this interpretation project is concerned with is composed of the creek flowing between Williams Lake and the Northwest Arm, and the immediately adjacent land. This research will examine the period of time when the resources and land of the corridor were systematically used to manufacture products that were sold for a profit to the larger population. This falls in a period shortly after European settlement, continuing until the early 20th century. The location of these manufacturing activities over this period of time is documented in Appendix A.

#### Original use and European settlement

With Cornwallis' arrival in 1749, initial settlement activity was focused on the Halifax Peninsula. Fishlots on the Northwest Arm, and farm lots on its western shore, were laid out by the 1760s (Watts, 1994) to encourage settlement in the area. The goal was to firmly establish a British presence in the region, as well as to cultivate land to provide sustenance to Halifax (Landry, 2009). Indeed, stipulations outlined in the original grants required that landholders improve and cultivate a specified percentage of their land within a certain timeframe (Watts, 1994).

#### The first landowners: Trails, ice, and fish

Captain Daniel Hill was the first person to hold a deed for the land that would become the industrial corridor (Watts, 1994). He was granted a 200-acre lot that included the stream stretching from Williams Lake to the Arm, as well as an adjacent fishlot on the Arm (Watts, 1994).

When Hill died in 1772, his widow sold the grants to John Murphy, who then sold them to James Williams in 1780 (Watts, 1994). It is possible that this is the eponymous Williams of Williams Lake. Williams continued to operate the fishery for a number of years (Watts, 1994), and appears to have lived directly adjacent to it, on the peninsula side of the Northwest Arm (Blaskowitz, 1784). Due to the lack of refrigeration in this period, ice was an important commodity in the fish business (Watts, 1994). It is therefore likely that the trail parallel to the stream leading from the Arm to Williams Lake was used by Williams to harvest ice for his fishery activities (see map one in Appendix A) (Blaskowitz, 1784).

#### George McIntosh & William Cochran: The grist mill and the dam

In the mid-1780s, George McIntosh purchased Williams' property (Watts, 1994). The particularly harsh winter of 1795-96 precipitated massive food shortages, particularly of flour (Raymond & Watts, n.d.). This near-famine may have been a factor in the establishment, by McIntosh and his partner Cochran, of a grist mill and a house for a resident miller near the mouth of the stream flowing from Williams Lake (Raymond & Watts, n.d.). McIntosh and Cochran dammed the stream at its head in order to harvest power for the mill (Watts, 1994). These uses are recorded on map one of Appendix A.

The mill was a three-story building, with two large grist stones and adjacent granaries. Its proximity to the water allowed the easy transfer of the grain between ships and the mill (Watts, 1994). It provided flour and meal for settlers in the area (Watts, 1994). It is doubtful that the majority of grain milled was of local origin, however, because most of the surrounding land was not fertile (Focus group participant, February 13, 2015). More likely, grain was transported by ship to the mill, processed, and then shipped back out (Focus group participant, February 13, 2015).

In 1803, Cochran was forced to mortgage his portion of the mill and 450-acres of surrounding land, due to the accumulation of debt (Watts, 1994). A few years later, the sale of the grist mill was advertised in *The Royal Gazette* newspaper (Watts, 1994). In 1808, a rudimentary trail appeared in the place where part of modern-day Purcell's Cove Road now runs (Watts, 1994). This road, which eventually connected to Halifax, made travel by land between the mill and the city easier (Watts, 1994).

## Robert Letson: The tannery and the bark mill

In 1811 Robert Letson, a Loyalist who had immigrated to Halifax from New York, bought the McIntosh/Cochran mill property (Watts, 1994). He had run a saddlery business in Halifax town, but retired to the mill site with his family after he purchased the land (Watts, 1994).

Letson used the stream to operate bark mills for the tannery he



Figure 11: Sketch of Letson's Mills, n.d.

(Mainland South Heritage Society, 2015)

built on the land, both of which are depicted on map one of Appendix A. The use of bark to tan skins was a common practice amongst European settlers in North America, who would employ bark mills to extract the tannins (Traditional Tanners, n.d.). Tannin is the active chemical used to process raw hides, and is found in many plants (USDA, n.d.). In particular, it is concentrated in the bark of certain tree species, such as oak and hemlock (USDA, n.d.). Bark mills were used to crush the bark so that it was easier to extract the tannin (Traditional Tanners, n.d.). The exact model of the bark mill Letson used is unknown, although an 1823 news article in the *Acadian Recorder* indicates that it used water power (The Acadian Recorder, 1823), rather than traditional horse power. Figure 13





depicts a Catskills bark mill, which was the most commonly used bark mill design in the Americas in the 19<sup>th</sup> century (Muspratt, 1859).

Aside from utility in powering the bark mills, it was logical to locate tanneries beside streams (as Letson's was) because leaching the tannins from the processed bark required copious amounts of water (Traditional Tanners, n.d.). The hides would then be soaked in tanning pits with the tanninextract solution, where the astringent properties of the chemical would cause the pores to tighten and the skin to become leather (Muspratt, 1859). It is

unknown where the hides for Letson's tanneries were procured, although some of the surrounding farmers did keep livestock (Focus group participant, February 13, 2015). The coastal location of Letson's property also made it easily accessible to ships, so it is also possible that hides arrived this way. It is difficult to say where the bark mills may have been located on the corridor property. Several depressions beside the creek, on its northern bank near the dam, are purportedly the remnants of the tanning pits (Raymond, M., Personal communication, January 30, 2015). Once leather was produced by subjecting the hides to a series of tannin-solution baths at the tannery, it was sent into town to Letson's saddlery, which he had bequeathed to one of his sons (Watts, 1994).

In 1816, Letson died, leaving an outstanding mortgage to Cochran's trustees (Watts, 1994). Letson's remaining family was unable to meet payments, and the mortgage was foreclosed in 1822, forcing them to abandon the site (Watts, 1994).
# Richard Dingle: Repairing the mill

The mill site, along with the tannery and bark mills, was promptly sold to Richard Dingle in 1822 (Robertson, n.d.). The mill and dam were in ill-repair at this point, after many years of use, but Dingle quickly restored them to working order (Watts, 1994). Unfortunately, a mere two months later, the refurbished mill, along with 2,000 bushels of wheat and corn, was destroyed in a fire started by a careless servant (The Acadian Recorder, November 9, 1822). A plea for donations was circulated in Halifax, and enough capital was raised to give Dingle a start at rebuilding (Watts, 1994). It was not enough to complete the project, however (Watts, 1994), and his petitions to the Legislative Assembly for more money went unanswered (Robertson, n.d.). In defeat, Dingle put the site up for sale (Watts, 1994). An 1823 advertisement in *The Acadian Recorder* announced the leasing of the tannery on the Northwest Arm, formerly owned by Mr. Letson, with tan pits and a bark mill in prime condition, and an abundant supply of fresh water to power the bark mill (The Acadian Recorder, February 1, 1823).

#### The Lawsons: The nail factory, the brewery, and Sandwich Mills

In 1831, William Lawson signed a five-year lease for use of 50 acres of the mill land (Watts, 1994). Confusingly, the original lease states that the grist mill—which had burnt down in 1822 and which Dingle had been unable to completely rebuild—was in working order, although beginning to show wear from years of use (Wallace, 1831). Perhaps the mill had not been entirely destroyed in the inferno, or perhaps some unrecorded financier had stepped forth to finish Dingle's work; we can only speculate as to the real explanation for this apparent anachronism. Interestingly, after the sale of the land to Lawson, no further mention of the tannery or bark mills appears, indicating that these industries had fallen out of use on the site.

William Lawson and his brother Robert quickly set to work finding new ventures to exploit the power of the stream on the land. In 1831, soon after assuming the lease, Lawson constructed a nail works factory on the corridor site (Robertson, n.d.). The factory was up and running by 1832 (Watts, 1994), using iron imported from Britain (Lawson, 1838) and machinery procured from Boston to manufacture "iron hopper cut nails" (Robertson, n.d.). Eventually Robert constructed a brewery on the site (Watts, 1994), although the exact date is unclear. In her article on industrial activity on the Arm, Robertson speculates that the brewery may have been situated adjacent to the new Sandwich Mills (see below) (Robertson, n.d.). These activities are illustrated on map two in Appendix A.

In 1836, when Lawson's lease ended, he purchased the corridor land (Regan, 1904). In 1838,

William Lawson leased an acre of land on either side of the stream to two of his relatives, George and Henry (Watts, 1994). The two men built a new grist mill on the site, equipping it with a 23-foot wheel and imported machinery from New York so that they could produce superfine flour (Robertson, n.d.). They spent \$5000 on buildings, machinery, and the dam (Robertson, n.d.). This new mill would become known as "Sandwich Mills" (Watts, 1994). This name is possibly related to the previous British misnomer of the Northwest Arm as the "Sandwich River," when early settlers mistakenly thought it was the mouth of a river (Armdale Yacht Club, n.d.).

There were only two other grist mills in Halifax at the time (Chocolate Lake and Bedford), which was insufficient to meet the demands of a growing population; the construction of Sandwich Mills helped to meet these needs (Watts, 1994). It is unclear what happened to the former mill that was described in the original lease to William Lawson. It may have been razed to make room for this new mill, or was retrofitted to become Sandwich Mills. Many of the farming families in the area probably sent their meagre grain harvest to Sandwich Mills (Watts, 1994). The bulk of the grain processed at the mill was likely received from more fertile areas such as the Annapolis Valley or Lunenburg (Raymond & Watts, 2003).

In 1839 fire once again ran rampant through the site, destroying both the nail works and the brewery. No mention is made of damage to Sandwich Mills in an 1839 newspaper article reporting on the fire (Robertson, n.d.), but by 1841 it appears that Lawson was again building a grist mill and importing machinery from New York (Robertson, n.d.). This mill would go on to thrive, reporting profits of \$100 per day (Watts, 1994).

## G.H. DeWolfe: The Halifax Ice Company

In 1863, a Halifax newspaper, *The Sun & Advertiser*, published an article admonishing Nova Scotians for failing to enter the ice trade in a large, commercial fashion (Sun & Advertiser, 1863). The New Englanders had met with great success in harvesting their ice and exporting it to warmer markets (Sun & Advertiser, 1863). The paper goes on to note that quality ice must be cut from lakes with minimal weeds, and with gravelly or sandy bottoms, to ensure that the product is solid and dense, therefore taking longer to melt (Sun & Advertiser, 1863). As an oligotrophic ecosystem, Williams Lake's clear, sparsely vegetated waters fulfilled these prerequisites.

DeWolfe and his partners took up the challenge, and leased a portion of Lawson's land around Williams Lake and Lawsons Creek for the purpose of establishing an ice business, called The Halifax Ice Company (Watts, 1994). A wooden trestle parallel to the creek, likely along the trail that lead up to the lake, was constructed for the purpose of transporting cut ice down to the Arm (Focus group participant, February 13, 2015). An ice store house was also built at the end of the trestle, near the mouth of the creek, in which ice could be sheltered before being loaded onto boats bound for both downtown Halifax and more distant destinations, such as Boston or Bermuda (Focus group participant, February 13, 2015). These features are noted on map three of Appendix A.

The Sun & Advertiser ran a second article in 1865, at which point the Halifax Ice Company was already in operation (Sun & Advertiser, 1865). The paper describes how the ice house was situated 1,200 feet from Williams Lake, linked by a 21 foot tall trestle (at its terminus at the Arm) which obviated the need to hoist ice as the store house filled (Sun & Advertiser, 1865). At its lake end, the trestle was only five feet high, and the cut ice was raised onto it using a pulley system (Sun & Advertiser, 1865). This system was quite efficient, transferring about six tons of ice every two minutes from the lake to the storehouse (Sun & Advertiser, 1865). The wharf next to the storehouse could accommodate ships as large as 700 tons (Sun & Advertiser, 1865). This business was apparently quite successful, and would persist under the same management for sixteen years.

#### Miles & Chittiwick: Ice business continues, and the Atlantic Sugar House

In 1881 Lawson began to sell off his property around Williams Lake (Watts, 1994). He partitioned his water lots No. 1 and No. 2, and sold part of each to Miles and Chittiwick, and to The Atlantic Sugar House Company (Regan, 1908). The portion purchased by Miles and Chittiwick contained the ice business, which they continued to operate for another ten years (Watts, 1994). The land sold to the Sugar House was situated around Mill Cove (Watts, 1994).

Sugar refining had been carried out in Halifax since 1815 (Robertson, n.d.), and had boomed,



Figure 13: The Atlantic Sugar Refinery, ca. 1900

city in 1879 (Watts, 1994). The Atlantic Sugar House was up and running by 1886 (Robertson, n.d.) in a six-story brick building. As was noted by a focus group participant, materials in this era were often reused because of the cost and the difficulty transporting them (Focus group participant, February 13, 2015), and accordingly the Sugar House incorporated old construction stone from the mill site (Robertson, n.d.). See map three of Appendix A.

with 16 million pounds of raw sugar refined in the

While the lake water was still important for the industry on the site, its role had changed. Now the

water was employed in boilers, using the technology of steam power to fuel the Sugar House (Robertson, n.d.). Raw cane sugar was likely obtained from the Caribbean, and brought by ship to the refinery (Focus group participant, February 13, 2015).

#### The decline of industry

In 1891, *The Morning Chronicle* ran an advertisement announcing the sale of the Halifax Ice Establishment (Shand, 1891). The article described the property as having 13-acres, a barn, an ice house, an appurtenance, and a wharf for large vessels (Shand, 1891). While Shand observed that the deed also contained exclusive ice harvesting and shipping privileges, more presciently he noted the charming seaside locale's suitability for summer residences (Shand, 1891). At the end of the 19th century, Williams Lake and its environs were beginning to be used for leisure and recreation, such as skating and boating (Watts, 1994). Halifax city had grown enough that people yearned for an escape from the intense urbanization, and started to flock to the pristine, natural area around Williams Lake, which was only a short distance outside the city (Watts, 1994).

The Atlantic Sugar House persisted until 1906, when, defunct, it was purchased by the Saraguay Club (Robertson, n.d.), who were also granted water rights over Lawsons Creek (Watts, 1994). Industrial activity in the area became obsolete, and the area around Williams Lake and Lawsons Creek transitioned to fully residential and recreational uses (Watts, 1994).

#### Conclusion

The creek and the land between Williams Lake and the Arm have a rich industrial history, spanning 150 years between the mid 1700s and 1900. Several enterprising figures and families recognized the opportunities offered by the creek, and were the main driving forces behind industrial activity. For such a small area of land, it is astonishing how diverse and varied its array of uses was.

# **Current day situation**

# The corridor site in 2015

Very little industrial infrastructure from the flurry of industrial activity in the 18th and 19th centuries remains on the corridor site. The mills and refineries have vanished almost without a trace. None of the old manufacturing families have a stake in the corridor; these days the site is faced with the prospect of residential, rather than industrial, development. Even the routes one traverses to access Williams Lake have changed.

# A. Remains of the corridor

Looking at the corridor site, the uninformed eye would never discern that any sort of industrial activity had taken place there. The land around Mill Cove hosts a large, stately building (The Royal Nova Scotia

Yacht Squadron clubhouse), and many small recreational vessels are berthed at the wharf. Once one wanders up the brook, away from Purcell's Cove Road, the landscape is bucolic, serene, and forested.



Figure 14: Remains of the industrial corridor, 2015

Even to those well versed in the history of the landscape, the physical remains of the corridor are disguised (Figure 15). The old trail that was established as a conduit for transporting ice down from Williams Lake, in the time of Daniel Hill, is still visible. It has fallen out of use, however, and a "No Trespassing" sign is strung out across its ingress at the Williams Lake dam (Figure 16). Jutting

out of the south bank of Lawsons Creek, near where it empties into the Arm, are the remains of a structure (Figure 17). These may be the foundations of Sandwich Mills, which burned in 1910 (Watts, 1994). Subtle depressions near the dam are thought to be the old tanning pits from the time of Letson (Raymond, M., Personal communication, January 30th, 2015). The dam (Figure 18) is perhaps the most visibly obvious artifact, although the Williams Lake Conservation



**Figure 15: "No Trespassing" sign across the trailhead** Photo by Rachael Nicholls, January 26<sup>th</sup>, 2015

Company (WLCC) reconstituted it in the late 1960s (Watts, 1994). The WLCC was originally incorporated for the purpose of managing the dam, and the organization currently holds the water rights to the lake (Watts, 1994).

Parts of the Royal Nova Scotia Yacht Squadron clubhouse (Figure 19) are also camouflaged remainders of the corridor. The McCurdy family had purchased the corridor land in the 1920s, and in 1926 demolished the decrepit Atlantic Sugar House (Watts, 1994). Pearson McCurdy incorporated



Figure 16: Rock wall embedded in Lawsons Creek bank



**Figure 17: The dam at Williams Lake** Photo by Rachael Nicholls, January 26<sup>th</sup>, 2015

some of the stones and beams from this structure into the new house that he built on the same site, adjacent to the mouth of Lawsons Creek (Raymond, M., Personal communication, January 30th, 2015).

Several objects dating back to the time of the industrial corridor have also been discovered around the site over the years. As the shore of Williams Lake erodes, bricks with the stamp "Glenboig" (Figure 20) have become visible, embedded in the edge of the lake immediately beside the dam on its north side. These bricks originate from the town of Glenboig, Scotland (Glenboig Memories, n.d.). Glenboig Union Fireclay Company was a brickworks business founded in 1865 by James Dunnachie and John Hurll (Glenboig Memories, n.d.). By 1875 these two men had made the quality of Glenboig brick world renowned, and their bricks were exported internationally, including to Canada (Monkland Memories, 2013). Glenboig Union Fireclay Company would last until 1936 (Glenboig Memories, n.d.). It is thus difficult to pinpoint a

precise date when the bricks may have been manufactured, but it was likely between 1875 and the 1930s (Glenboig Memories, n.d.). What structure these bricks may have composed near the dam remains a mystery, as the majority of industrial activity took place down near the mouth of Lawsons Creek. Although the tannery and bark mills may have been located close to the dam, they predate



**Figure 18: Recycled Yacht Squadron beams** Photo by Rachael Nicholls, January 26<sup>th</sup>, 2015

1875 by several years. The bricks are possibly related to infrastructure associated with the trestle and the Halifax Ice Company, which would have been contemporary to the period when Glenboig was in operation and exporting internationally. It is also possibly that they were used in some post-industrial structure, when Williams Lake had become an area of recreation.

A second object discovered at the dam site by a local resident is a flat metal button, bearing an insignia of

three cannons inside a shield (Figure 21). I conducted a web search, and found it to be a generic

issue, second pattern, British military officer's button (Colchester Treasure Hunting Club, n.d.). The three cannons denote someone of the British Royal Artillery (Nova Scotia Museum, 2001). This edition was produced between 1775 to 1800 (Nova Scotia Museum, 2001), although some sources say that it may also have been used in the war of 1812 (1812 History Digitization Project, n.d.). These buttons were commonly given to someone who had been involved in the American Revolutionary War as



**Figure 19: Glenboig brick found near dam** Photo by Rachael Nicholls, January 26<sup>th</sup>, 2015

surplus (Nova Scotia Museum, 2001). Many Loyalists fled to Nova Scotia in the aftermath of the war, so it possible that this how the button came to be near Williams Lake. One focus group participant also mentioned that British military once had had an interest in the rock quarries on the

southern shore of Williams Lake, so this may explain how the button came to be found next to the dam (Focus group participant, February 13, 2015).



Figure 20: Military button found near dam

Photo by Rachael Nicholls, January 26<sup>th</sup>, 2015

# **B. Current ownership**



Figure 21: Ownership of the land surrounding the corridor

All of the corridor land is privately owned (Figure 22; see Appendix B for the land survey map). The portion abutting the Northwest Arm, at the mouth of Lawsons Creek, was fully developed before the 20th century. The Royal Nova Scotia Yacht Squadron clubhouse currently occupies the space (Figure 23). A developer, Clayton Developments, owns the majority of the land in the area. The largest parcel (to the south)—which includes the dam, the western portion of Lawsons Creek, and the old trail that runs parallel to it)—and a second lot to the north were bought by Clayton Developments in 2012 (Our HRM Alliance, 2012). The two long narrow lots, sandwiched between the Clayton Development parcels, are privately owned (Service Nova Scotia and Municipal Relations, 2006a). These two parcels used to be the same lot (Service Nova Scotia and Municipal Relations, 2006b). The most northerly of the two (the long triangular one), is the result of a discrepancy between two different survey coordinates of the original parcel's northern boundary, one from 1938 and the other from 1963 (Service Nova Scotia and Municipal Relations, 2006b).



Figure 22: Private owners of corridor land

# C. Access to Williams Lake and Lawsons Creek

There is currently very little public access to Williams Lake and to Lawsons Creek. The old trail running parallel to Lawsons Creek, dating back to the time of Daniel Hill (1760s), exists almost entirely on land privately owned by Clayton Developments (Figure 23). The exact spot where the old trail intersects with Purcell's Cove Road is ambiguous, and may be either on the Clayton Developments lot or the privately owned parcel. This ambiguity is more accurately and visibly represented in the Halifax County Land Registration survey of the lots, found in Appendix B. One of the focus group participants recalls using this trail to visit Williams Lake as a child (Focus group participant, February 13th, 2015). Upon returning to Halifax after several years away, she discovered that a gate and a "No Trespassing" sign had been erected across the trail (Focus group participant, February 13th, 2015). A second participant, February 13th, 2015). Additionally, she had never used the trail because her mother had always warned her away from it with fearful tales regarding the property owner (Focus group participant, February 13th, 2015). The participants agreed that they had not observed anyone using the trail in many years, and that it was unlikely that it would be recognized as a public right-of-way (Focus group participants, February 13th, 2015).

Several informal trails, starting from Purcell's Cove Road on the north side of Williams Lake, extend across private land to the dam (Figure 21). These trails are used by many residents of the area to access the lake for recreation and leisure purposes (Focus group participants, February 13th, 2015). There is some concern by users of the trails that the family who owns the two lots, between the Clayton Development lands, is planning to build a house. The house's driveway would conflict with the trails, and restrict access to the area even further (Focus group participants, February 13th, 2015). Because these trails have been used by the residents for an extended period of time, however, there is a possibility that they could be recognized as a public right-of-way (Focus group participant, February 13th, 2015). In fact, the land registration for both lots contains a qualification pertaining to one of these footpath's long history of use by the public, as well as a reference to an "access easement recorded in a Right of Way Agreement recorded on August 16, 2006 as document number 85893460" (Service Nova Scotia and Municipal Relations, 2006). Additionally, the surveyor's map, drafted in 1991 (filed in 1997, and re-registered in 2006), shows the trail leading to Purcell's Cove Road, preceded by a symbol that could potentially indicate an easement (Appendix B). Interestingly, the land registration for the family's northern lot indicates that the parcel access is public (Service Nova Scotia and Municipal Relations, 2006a). Although this lot does not lead to the corridor land, it does make Williams Lake accessible.

# Land-use and proposed development

# A. The Halifax Regional Municipal Planning Strategy: RP + 5

The Halifax Regional Municipal Planning Strategy (MPS) is the overarching policy meant to guide the trajectory of urban development and growth in Halifax (HRM, 2015a). It establishes a long-term vision for the Region by outlining broad planning policies and goals (HRM 2015a). The plan was approved in 2006, and underwent its first five-year review in 2011; an amended plan (RP + 5) was released in 2014 (HRM, 2015a). The revised MPS contains several policies that are relevant to the corridor land and its future.

# Riparian buffers

Riparian areas are ecosystems associated with streams or lakes; specifically, they are the vegetation growing on the banks of theses water bodies (Pratt, 2014). Riparian areas are the transition zones between water and land, and serve as habitat for both aquatic and terrestrial organisms (Pratt, 2014).

HRM legislation aims to protect and retain vegetated areas on the banks of its watercourses, forming riparian buffers (HRM, 2014c). These buffers have a variety of functions. HRM uses them to: protect water quality and habitat; prevent erosion, sedimentation, and flooding; regulate water temperatures; and give aesthetic value to an area (HRM, 2014c). Preserving native vegetation on the banks of streams and rivers also has filtration and nutrient recycling functions (HRM, 2014c).

There are no overarching Province-wide regulations for riparian buffers or setbacks in Nova Scotia, although certain industries such as forestry are subject to legislation requiring 20 metre wide setbacks from watercourses (Rideout, 2012). Some municipalities use their Provincially-delegated power to create land-use bylaws to enact buffer requirements (Rideout, 2012). HRM has implemented this, enshrining vegetated setback policies in its Municipal Planning Strategy (Rideout, 2012).

In order to obtain the various benefits offered by riparian buffers, RP + 5 stipulates that a minimum 20 metre buffer must be maintained around all watercourses in HRM (HRM, 2014c). Lands dedicated "Halifax Harbour" by the Generalized Future Land Use Map are exempt from this requirement, however, due to the intensive marine uses that take place in these areas (HRM, 2014c).

By-and-large, development within buffers is not permitted (HRM, 2014c). There are several



Figure 23: Riparian buffer requirements

potential exceptions to this, however, such as for access, cultural, and park uses. To see the full list, please refer to Appendix C.

These riparian buffer considerations are important for the historical industrial corridor due to the fact that nearly the entire site is situated within 20 metres of a waterbody. The western terminus of the corridor is lacustrine in nature (Williams Lake), while the corridor itself follows a creek; both of these features are subject to buffer requirements (Figure 24). The Northwest Arm is part of the Halifax Harbour designation and so HRM does not require the protection of a riparian buffer.

# Greenbelting

In RP + 5, the concept of greenbelting emerged as a major theme and future goal for the Region (HRM, 2015b). Greenbelts are areas of farmland, forest, or open space surrounding a city with the purpose of creating a barrier to limit development and outwards sprawl (HRM, 2015b). Permitted uses within greenbelts include recreation and leisure activities, as well as cultural and heritage uses (HRM, 2014c). Greenbelts can be viewed as networks of open land and protected space that work to shape the urban fabric (HRM, 2014b). A Greenbelting and Public Open Space Priorities Plan is being devised (HRM, 2014c). This plan will be used to guide the development of a greenbelt around Halifax, and will identify lands of ecological, cultural, and environmental significance for inclusion in this network (HRM, 2014c). While the plan is being developed, riparian buffer protection will be increased, and will serve a foundational component for the new plan (HRM, 2014c).

The corridor land falls into several of the typologies (outlined in the RP + 5 plan) that are slated for inclusion in the greenbelt network (HRM, 2014c). For example, various parts of the corridor land may be regarded as Natural Resource, Recreation and Leisure, Heritage & Culture, or Community Form open space typologies (HRM, 2014c). Given this, it seems that this area could be included in a future greenbelt.

# Culture and heritage resources

RP + 5 contains a chapter on cultural and heritage resources (Chapter 7). The policy objective is to help communities identify, preserve, and promote cultural assets and landscapes (HRM, 2014c). Chapter 7 discusses and supports the multiplicity of plans and policies that HRM has adopted, and is in the process of further developing, to guide the protection and management of heritage resources (HRM, 2014c). Cultural planning is in the municipal vocabulary, and part of a broader vision and priority for the city.

The historic industrial corridor, which was representative of significant industries over time in

the development of Halifax, arguably qualifies as a historical cultural feature. The protection and enhancement of this area would conform to the purported municipal mandate to preserve a rich cultural fabric, as articulated in the MPS. The lack of conspicuous physical remains is a barrier to it garnering the recognition required to fuel action and inclusion into municipal cultural planning, however.

# B. Zoning: Halifax Mainland Land-use Bylaw

There are four land-uses (Urban Reserve, Single Family Dwelling, Holding, and Water Access) in close proximity to the historic industrial corridor (Figure 25), although most of the actual site occupies land that is designated Urban Reserve.



Figure 24: HRM Mainland Land-use zoning

Uses permitted within these zones are outlined in the Halifax Mainland Land-use Bylaw (including October 2014 amendments), and are summarized in Figure 26 below:

	<b>R-1 (Single family dwelling zone)</b> (page 30 of the LUB)	<b>H (Holding zone)</b> (page 82 of the LUB)	<b>UR (Urban</b> <b>reserve zone)</b> (page 84 of the LUB)	WA (Water access zone) (page 102 of the LUB)
Permitted Uses (HRM, 2014a)	Detached one-family dwelling; office of professional located in dwelling and used by professional as residence; home occupation; public park/playground; church; golf course; tennis court; yacht or boat club; public recreation centre; day care (not more than 8 children in conjunction with dwelling); special care home (not more than 10 people with staff); accessory uses to the above	Detached one family dwelling with on-site sewage and water services; public park/playground; public recreation centre (provided that sewer/water service connections are made to existing city services); office of professional located in dwelling and used by professional as residence; accessory uses to above	Single family dwellings, on existing lots or lots approved pursuant to Section 38 of the Subdivision By- law (page 11) provided that a private on-site sewage disposal system and well are provided on the lot; passive recreation uses; accessory uses	Wharves/ docks; municipal/ provincial/ national historic sites and monuments ; passive recreation uses; public works and utilities

Figure 25: HRM Mainland zoning requirements

# **C. Proposed Development**

Municipal sewer and water services do not extend to the area, but the land is within easy commuting distance (approximately six to eight kilometres) of the Regional Centre, so development for residential use is appealing (Our HRM Alliance, 2012). The area, however, was zoned "Urban Reserve" in the 2006 Halifax Regional Municipal Planning Strategy (MPS), a designation which limits development in the immediate future (Our HRM Alliance, 2012). With the 2014 review of the MPS, some of the owners of the land pushed for a change in zoning from "Urban Reserve" to "Urban Settlement" or "Rural Commuter" (Our HRM Alliance, 2014). This re-designation would open the area to low to medium density development (Bousquet, 2014). This concerns some residents and wilderness conservationists, who regard more development as a threat to the integrity of the Williams Lake watershed and its habitat (Bousquet, 2014).

In May 2014, City Council voted on whether or not to adopt these proposed zoning changes and incorporate them into the RP + 5 plan (Taylor, 2014). The motion was defeated in a tie vote,

and the "Urban Reserve" designation persisted into RP + 5 (Taylor, 2014). At the same meeting, a Councilor tabled a second motion that may change the course of ownership in the area (Taylor, 2014). The motion proposed that HRM embark on a public engagement process to discuss the possibility of purchasing the area from owners willing to sell their lots (Taylor, 2014). This means that there is a possibility that the municipality or the Province could eventually purchase some of the lands, turning them into public property (Taylor, 2014). Most recently, municipal staff tabled a report recommending that Halifax's potential purchase of the area should be considered from the perspective of incorporating the land into a future greenbelt, and that this option should be further explored in the upcoming Greenbelting and Public Open Space Plan (Taylor, 2015). It seems plausible that, with few prospects of development in the near future, Clayton Developments would be willing to part with its share of the land should HRM or the Province offer to buy it. Much of the corridor site sits in this area, most significantly the old trail, public ownership of which would allow for greater site access. It is less certain that the privately owned lot would be sold, since there is a residence on it (Service Nova Scotia and Municipal Relations, 2006). Additionally, it is doubtful the Royal Nova Scotia Yacht Squadron, a successful recreation club, would sell their land.

# **Other guiding frameworks**

# A. The 2009 Nova Scotia Master Interpretive Plan

The Nova Scotia Department of Tourism, Culture, and Heritage developed a Master Interpretive Plan to help guide the management and interpretation of the Province's cultural and heritage resources. The plan articulates four overarching goals, which should form the foundation of any interpretation project in the Province. The goals are:

1. Contribute to common understanding and appreciation of the heritage of NS through interpretation;

- 2. Achieve sustainability by ensuring that the Heritage Division thrives into the future;
- 3. Ensure that interpretation is authentic, relevant and inclusive for all audiences; and
- 4. Ensure best practices in interpretation are followed.

(Nova Scotia Tourism, Culture, and Heritage & Nova Scotia Museum, 2009, p.v).

The Plan aims to define and interpret stories of Provincial significance (Nova Scotia Tourism,

Culture, and Heritage & Nova Scotia Museum). Provincially significant features refer to "that eclectic mix of landscapes, sites, specimens, objects, documents, popular culture, and folklore, that, together, speak to the uniqueness of Nova Scotia" (Nova Scotia Tourism, Culture, and Heritage & Nova Scotia Museum, 2009, p.2). In order to successfully interpret these features to the public, the Interpretive Plan further breaks each goal (above) into specific objectives, and outlines interpretation best practices (Nova Scotia Tourism, Culture, and Heritage & Nova Scotia Museum, 2009).

The plan also establishes themes about Nova Scotia that any interpretation should aim to communicate to visitors. The main theme is how Nova Scotia's natural and cultural heritage has instilled a strong sense of place and identity in its citizens (Nova Scotia Tourism, Culture, and Heritage & Nova Scotia Museum, 2009). There are also five sub-themes, which are:

1. How Nova Scotia has an environment shaped by ocean and the northern hemisphere;

2. How Nova Scotia has engaged with the world;

3. How Nova Scotia has been shaped by conflict and cooperation;

4. How Nova Scotia has struggled to fulfill political and economic equality; and

5. How Nova Scotia is diverse, and continually evolving.

(Nova Scotia Tourism, Culture, and Heritage & Nova Scotia Museum, 2009).

Any cultural interpretation planning involving the historical industrial corridor will need to adhere to this document.

# B. Standards and Guidelines for the Conservation of Historic Places in Canada

This document was compiled by the Government of Canada, in conjunction with the Provinces, as a pan-Canadian manual to guide and standardize heritage conservation practices (Parks Canada, 2011). Conservation is understood as a series of interlinked and co-dependent actions, distilled into three steps (Parks Canada, 2011). The steps are as follows:

1. Understanding a historic place through research and investigation;

2. **Planning** as the tool to concatenate holistic understanding with interventions that will preserve a feature's heritage integrity; and

3. **Intervening** in a historic place, which in any way physically alters its character-defining elements, must preserve that place's heritage value.

(Parks Canada, 2011).

Preservation, rehabilitation, and restoration are the three constituents of conservation in Canada (Parks Canada, 2011). The document outlines 14 internationally recognized standards to which a conservation project must adhere (Parks Canada, 2011). These Standards and Guidelines are meant to direct conservation decision-making related to four types of resources, of which cultural landscapes is one (Parks Canada, 2011). Conservation or interpretation carried out at the corridor site should conform to these federal guidelines.

# Possible interpretation plan content

Through this (and other) research, a variety of interesting stories has been unearthed concerning an area of industrial activity that used to stretch between Williams Lake and the Arm. The corridor is an important piece of local history, yet many residents are oblivious to it. While this area itself is small, it may be representative of the broader manufacturing activities that once took place in Halifax, and is part of the city's rich industrial growth and heritage. An interpretation plan could help to foster an appreciation of the cultural landscape of the industrial corridor by making it relatable and tangible to current residents. Additionally, using interpretation to inform residents of this shared past may encourage a sense of place and foster a sense of community identity (Hester, 2006).

Simply relaying facts about the corridor to the public is not interpretation. An overarching framework to unite the various threads that make up place needs to be crafted. This section will suggest themes, and corresponding narratives, to form the skeleton of interpretation for the historic industrial corridor site.

# A. Theme one: The relationship between the natural environment and industrial activities

Theme one will explore the natural environment of the site, and how it shaped and determined the diverse industrial activities that took place there. The activities in the corridor may also be representative of the activities that took place in other parts of the Province, particularly those that have a similar environment to the corridor. This potential theme is harmonious with the *Nova Scotia Interpretive Master Plan*, which identifies the topic of Nova Scotia's unique natural environment as a province-wide interpretive theme (Nova Scotia Tourism, Culture, and Heritage & Nova Scotia Museum, 2009). The following narratives can be used to support this theme:

## Coastal location, bathymetry, and shipping

Much of the industry of the corridor relied on imports and exports. Before widespread paved roads and automobiles, most trade was done using ships. Coastal industry was an advantage for this reason. But it was not enough for the industrial corridor to be situated on the coast. If the Arm had been too shallow, the wharf at the mouth of Lawsons Creek would have been unable to support the shipping activities required for the corridor's activities. Grain, ice, nail iron, machinery - these were all heavy products, and required large ships, which in turn required deep water. In fact, its deep wharves were often used as a selling point for the corridor area when it was being put up for lease or for sale.

## Water flow and topography: the stream as power and the trestle

Lawsons Creek is the most significant feature of the corridor site. McIntosh and Cochran were the first to harness the energy of the fast-moving creek by constructing a dam. Dams serve to control the flow of the water, ensuring that it remains constant, and is therefore always available to provide power (Hazen, 1996). The grist mill, the bark mill, the

nail factory, the brewery, and the Atlantic Sugar House all relied on this water to fuel their operations. The tanning pits also relied on a steady supply of fresh water.

The slope also made it possibly to efficiently and expediently transport heavy blocks of ice from Williams Lake to the Arm. The trestle that connected these two points relied on gravity to push the frozen product down its chute.

#### Water quality and success in the ice trade

The best quality ice melts slowly because it is dense and contains minimal air bubbles and vegetative matter. This is obtained from lakes that have rocky or gravelly beds, with scant weed growth. The oligotrophic nature and clear waters of Williams Lake are conducive to these sparse, rocky conditions. This is likely the reason that the ice that was harvested from Williams Lake was of a quality that allowed its trade to flourish, and set up the Halifax Ice Company for such longevity and success.

#### **Fire-proneness**

This narrative is double-sided. On the one hand, the natural environment's fire-proneness had a

destructive influence on human activity in the corridor. The fire-susceptibility of the landscape meant that the area was already subject to regular burning, a characteristic which was only exacerbated by the arrival of Europeans and their technologies. At least three fires struck while there was industry on the site, compromising structures each time (Dingle's mill, Lawson's nail factory and brewery, and Sandwich Mills were all burnt). While most of these fires were likely human in origin, the fire-proneness of the surrounding landscape likely did not help to quell the blaze and check the destruction.

On the other hand, fire is an essential element in the function of the corridor ecosystem. The qualities of this specific ecosystem are what allowed for certain industrial activities to take place on the site. Most notably, oak trees thrive with regular fire activity, so long as it remains at the surface level, because it aids them in outcompeting other species. This species' importance to the tannery is discussed below.

## Vegetation and tanning

Tannin, the active chemical used in the tanning process, is more concentrated in certain species of trees, such as oak (Traditional Tanners, n.d.). In fact, *tannin* is the old German word for oak (USDA, n.d.). Red oak grew around the site of the industrial corridor, on its own and mingled into mixed-wood stands such as those located on the drumlin to the south of Lawsons Creek (Hill & Patriquin, 2014). The trees would have provided ample raw material from which to extract tannin, using the bark mill. The tannin was then used to prepare an astringent tanning solution for use in Letson's tanning pits.

# **B.** Theme two: The relationship between the global (national, provincial, and municipal events) and the local site (the industrial corridor)

The corridor did not develop or function in isolation from the larger world. This second

theme will investigate social and political events that were played out on the international, national,



Figure 27: Juxtaposition of historical global and local site events

# Comparative timelines

Rachael Nicholls Dalhousie University School of Planning 2015 provincial, and municipal stages, and explore how these activities influenced the activities of the corridor. See Figure 27 for a graphic juxtaposition of the developments in the macrocosm with the microcosm. This theme coincides with two of the sub-themes in the *Nova Scotia Interpretive Master Plan:* how Nova Scotia has engaged with the world, and how it has been molded by conflict and cooperation (Nova Scotia Tourism, Culture, and Heritage & Nova Scotia Museum, 2009). The following stories can be used to illustrate this theme:

#### A military town

From the start, Halifax was intimately linked to conflict. The founding site was chosen for the defense advantages afforded by its geological features, such as its deep harbour and the view offered by its drumlin hill (Citadel Hill). These geological features, while advantageous for the military, also conferred some challenges to residents, and affected some of the activities that took place in the corridor. For example, the harsh, rocky nature of the landscape and poor, thin soils made farming difficult. As a result, the grist mill on the industrial corridor had to import most of the grain it processed, rather than obtaining it locally.

The boom-bust cycle of wartime prosperity followed by decline that resulted from Halifax's role as a military base for the British in times of conflict, would also have affected the corridor. In times of war, when the city was teeming with soldiers, the grist mill would likely have been very active in supplying flour. Indeed, it was during a period of conflict when the stream was first dammed and the grist mill constructed. The tannery also become active during this same conflict. During periods of war quiescence the entire economy of Halifax was often sluggish. Operations at the corridor likely reflected a similar trend.

#### Immigration

Waves of immigrants were closely tied to conflict. For example, after the American Revolution, Loyalists flooded Nova Scotia; at the end of the Napoleonic Wars, European immigration swamped the province. While a sudden spike in the population would have stressed the resources of Halifax, it may have benefitted local producers and manufacturers, such as those with operations in the corridor, by increasing the size of the market.

Additionally, immigration infused the province with fresh blood, and provided the corridor with some of its most entrepreneurial spirits. For example, Robert Letson was a Loyalist who had fled to Halifax after the Revolution. He was the one who first implemented and operated a bark mill and tannery in the corridor.

# **Technology**

The activities of the corridor closely followed the trajectory of emerging technologies. The period between the 1820s and the 1880s was filled with technological advances, both internationally and provincially. The widespread paving of roads in Halifax may have facilitated the movement of goods from the corridor to and around the city, adding another means of transportation in addition to shipping. Steam ship technology made trade more efficient, and would have been advantageous to the Lawsons as they imported iron for their nail factory from Britain and machinery for their grist mill from New York. These faster ships also allowed ice to be exported to distant locales, reducing the time in transit and thereby the amount of melting that occurred during the journey.

## **Confederation and the railway**

Upon entering Confederation, Nova Scotia was promised a railway to connect it to Upper Canada. The completion of the Intercolonial Railway sparked a flurry of industrial development in Halifax, as it was anticipated that new markets would open up for Maritime manufacturers. The tariff imposed by the Dominion government on imported manufactured goods also gave impetus to this rapid industrial expansion. It was during this period that the Halifax Ice Company and the Sugar House made their appearance on the corridor.

Ironically, these factors that had sparked such industry would also engender its demise. While the railway gave Nova Scotia easy access to other markets, it also gave other markets easy access to Nova Scotia. The Maritime manufacturers were eventually outcompeted by Upper Canada, and the industrial corridor became obsolete.

# C. Theme three: How the nature of industrial activity and its relationship to local place changed over time

As mentioned earlier in this project, the perception of what "industry" is has evolved over time. The corridor is a particularly good example of this metamorphosis, because industrial activity was taking place there both before and in the midst of the industrial revolution. It is also worth noting that there was probably a lag time for the adoption of these new industrial technologies by the corridor users, due to its rural Canadian location. The local origin of manufactured goods in the corridor-era versus the remote origin of manufactured goods in our modern day society also makes for an interesting juxtaposition that could be examined. This suggested theme is an exploration of the changes to the corridor's industrial activities, in a time when the concept of "industry" was being

dramatically reimagined, as well as a comparison of industry in the corridor-era versus industry in the current-day. The following narratives can be used to support this theme:

## The scale of industry

The first industrial activities on the corridor were of a small scale, and generally operated and owned by a single family. Initially, harvesting ice from Williams Lake was a subsistence activity by individuals to preserve fish. The grist mill was operated by a live-in resident miller, and the tannery and bark mills appear to have been the project of a single family.

Over time, the physical size of the operations and the number of people required to run them increased. As efficiency in production was improved by technological advances, large-scale businesses that employed many people, such as the Halifax Ice Company, appeared on the land. The multi-story Atlantic Sugar House, using technological innovations such as steam power, was probably the pinnacle of this new, intensive industry.

# Technology and the relationship of industry to the land

Before the explosion of technology, the activities of the corridor were closely regulated by and dependent on the land. For example, transporting large amounts of heavy ice with sail ships would have been relatively slow, allowing the blocks to warm and substantially melt on the journey. The grist mill and bark mills were probably limited in their sizes by the capacity of the stream to produce useful power.

Steam power freed industry from the limitations imposed by place. Steam ships could take ice to far off destinations, delivering it in relatively good condition. Steam technology also allowed industry to generate more power from tiny Lawsons Creek than traditional water wheels; heating the creek water and using the resulting pressure to power machinery, rather than relying on the gravity-driven downhill-flow of the stream to move a wheel, was a more efficient way to harvest energy. Processes that might otherwise have been unfeasible became attainable. For example, the sugar refinery used steam to power its industrial operations. By the end of the 19<sup>th</sup> century, the relationship between industry and the environment had been substantially altered from what it had been when industrial activity first manifested in the corridor in the 18<sup>th</sup> century. Industry was more divorced from place, and could overcome many of the environmental impediments that would previously have constrained it.

# The origin of manufactured goods: the corridor era versus the current-day

The Williams Lake corridor provided Halagonians with everyday commodities such as grain, nails, and beer. Industry that manufactured the products consumed by a community was locally located to that community. A transition away from this localness is visible later in the corridor's operations (the mid-1800s), when products were shipped further abroad (such as ice being shipped to Bermuda). Today, it is rare for industry to be locally located; most of the products that we purchase (such as grain and nails) find their origin in distant locales.

# Interpretation methods and media

An interpretation plan is put into action and communicated to the public using a variety of media. The choice of medium depends on several factors, such as the content that is being interpreted, the budget and resources for the project, the audience, the intended visitor outcomes, and the physical setting (Carter, 1997). In this age of rapid technological advances, the media for interpretation continues to expand, which can present an intimidating array of options. This section will discuss some of these options. Because the historical industrial corridor site is in Nova Scotia, provincial best practices and standards, as well as examples of local interpretation, will be useful when considering what methods and media could be effective in an interpretation plan.

# A. Provincial best practices

The *Nova Scotia Interpretive Master Plan* provides guidance for best practice. These best practices should be used to inform interpretation methods of the corridor. In adhering to the Plan's practices, interpretation should:

- Put the visitor's expectations first;
- Ensure that the interpretation's themes are apparent throughout the experience;
- Address multiple learning styles;
- Provide a variety of media in order to cater to various interests;
- Understand that audiences are diverse, and act accordingly;
- Be socially relevant;
- Use novel communication styles; and
- Make use of new technology.

(Nova Scotia Tourism, Culture, and Heritage & Nova Scotia Museum, 2009)

# B. Examples of local interpretation sites

I made trips to several interpretation sites in the region to familiarize myself with, and gain insight into, some of the interpretation methods and media used in Nova Scotia. These visits were helpful for a number of reasons. First, since the corridor shares a climate with these sites, it was useful to see what sorts of media had been deemed suitable for the weather, temperatures, and conditions experienced by Halifax throughout the year. Second, it was interesting to see to what extent and in what ways these interpretation sites conformed to the provincial best practices. And third, having first-hand exposure allowed me to experience the strengths and weaknesses of various interpretation techniques.

# The Fairbanks Centre

The Fairbanks Centre, located in Dartmouth, Nova Scotia, adjacent to the Shubenacadie Canal, is a visitor information centre (Figure 28) run by the Shubenacadie Canal Commission. The centre is dedicated to interpreting the historic canal, which played an important role in Nova Scotia's history. Today, a portion of the canal is surrounded by open green space.



**Figure 27: Fairbanks visitor centre, Dartmouth NS** Photo by Rachael Nicholls, March 17, 2015



Figure 28: Model of the Shubenacadie Canal

Photo by Rachael Nicholls, March 17, 2015

A site visit to the Fairbanks Centre revealed it to be an extensive operation, with activities and interpretation features extending into the park surrounding the canal. A guide is stationed inside the centre, which is filled with publications, 3-D models of the canal (Figure 29), a TV playing relevant films, and various informative dioramas. Information panels (Figure 30) are numerous in the area surrounding the canal, as are small replica models. A visit to the Canal

Commission's website later revealed a host of other interactive activities that take place near the visitor centre and in the surrounding parkland, such as boating down the canal (Shubenacadie Canal Commission, 2015).

This interpretation site employed a diverse array of media to appeal to a variety of age groups

and interests. It was very interactive, and applied many of the best practices outline in the provincial manual. This is a resource-intensive operation, however, and would only be feasible with considerable funding.

# Point Pleasant Park

Point Pleasant Park is one of the largest urban parks in peninsular Halifax. Located on the southern tip of the Halifax peninsula, it is a popular site of recreation for many residents. It also contains a variety of naturally, culturally, and historically significant features. A "Cultural Walking Tour" of the park was developed in order to allow the public to more fully understand and appreciate these sites.

The tour can be accessed in two different ways.



**Figure 30: Interactive map on Point Pleasant's website** (Point Pleasant Park, 2011)



**Figure 29: Panel at the Shubenacadie Canal** Photo by Rachael Nicholls, March 17, 2015

Guests can visit the park website to view an interactive map, which shows 13 numbered icons scattered around the park (Figure 31) (Point Pleasant Park, 2011). Clicking on each icon allows the viewer to access a different audio commentary, narrated by a person with a special connection to that site. The second way to access the tour is by physically visiting the park, and following the numbered tour markers scattered throughout. Each marker has a QR code, which, when scanned with a smart phone reader, allows the visitor to access the same narrative that is

available on the website's interactive map (Point Pleasant Park, 2011).

This is a less intensive approach to interpretation than the one taken by the Fairbanks Centre, yet still fulfills many of the provincial best practices. Visiting the park is certainly an engaging method, provoking a multi-sensory experience and connection to the space, but the online tour has

its uses. For example, the park paths can be quite treacherous in the winter, particularly for people who have limited mobility, so a virtual tour may be a good alternative for some.

# C. Potential interpretation media

Given the Provincially-mandated best practices and examples of other interpretation in Halifax, a variety of interpretation media are presented below. Due to the small size of the historical industrial corridor site, as well as the fact that it is not widely recognized or known of, I have tried to suggest interpretation methods that could be implemented at a relatively low cost. Each medium comes with its own advantages and weaknesses, which are important to consider.

# Panels, signs, and models

Signs, panels, and models are conventional media, and are fairly simple to erect. These panels can be used to welcome visitors, give directions, or provide interpretation (Carter, 1997). Although signs and panels may be basic, careful design is key for effectiveness (Carter, 1997). When using panels, concision is necessary (Carter recommends not more than 200 words) (Carter, 1997). It is also important to situate them where people can read them easily, but so that they are not obstructing a view (Carter, 1997). 3-D models and dioramas can be useful in helping to illustrate a place. The model canal used at the Fairbanks Centre was very effective in highlighting the structure and machinations of the locks.

This form of media is relatively low-cost when one considers how many years it can last and how many visitors may see it (Carter, 1997). And unlike many technologically-complex media, it is accessible to anyone on the site.

Advantages	Disadvantages
Panels/signs can welcome visitors and explain necessary pieces of information, such as hours (where applicable), attractions and sights, limits of where they can go, and highlight potential trails or routes	Can be visually intrusive on the landscape
Can offer interpretation at any hour, and in any location accessible to people	Can be viewed by a limited number of visitors at once
Can integrate graphics and text	Information on them can be difficult to update
Wifi, data, and cellular reception are not a problem	Can be difficult to effectively interpret complicated stories on one panel

Accessible to most people, regardless of technological abilities or economic situation	Not easy to make exciting or create a sense of drama
Relatively inexpensive, given the longevity	Subject to weathering and vandalism
Do not require the visitor to have prepared for the visit ahead of time	Not efficient to offer multi-lingually
	Maintenance
(Carter, 1997)	

Figure 31: Advantages and disadvantages of panel media

# Information pamphlets and leaflets

Publications and pamphlets can be produced fairly cheaply, and with ease. They are portable, and



Figure 32: Example of an interpretive pamphlet

(Friends of Troopers Hill, n.d.)

can help to guide visitors around a preplanned route, while also providing a large amount of interpretation (Carter, 1997). Pamphlets can also be kept as a souvenir, and continue to educate long after the physical experience has ended (Carter, 1997). This media form can also act as stand-alone interpretation, without requiring a physical site visit. As with panels, design plays a key role in making an effective pamphlet (1997).

Advantages	Disadvantages
Can provide a lot of information	Need to be distributed somewhere, like a centre or a store
Offer interpretation that can be enjoyed after the visit has ended	Can be difficult to effectively interpret complicated stories
Can integrate graphics and text	Not easy to make exciting or create a sense of drama
Wifi, data, and cellular reception are not a problem	
Accessible to most people	

Cheap and easy to produce

(Carter, 1997)

## Figure 33: Advantages and disadvantages of pamphlets

# Podcasts

With the ubiquity of the internet, it has become common for travellers and tourists to do web-based research prior to travel (Henker & Brown, 2011). Many museums, parks, and cultural institutions have responded to this trend by offering interpretive podcasts online for streaming or download (Henker & Brown, 2011).

Interpretive podcasts can be employed as a stand-alone method, meaning that the listener is not actually present in the physical setting being discussed, but is experiencing it in an auditory fashion from afar (Henker & Brown, 2011). For example, Canyonlands National Park, Utah, has posted an eight-part podcast series on its website, meant to inform listeners about the park's natural and cultural features (Henker & Brown, 2011). This series is intended to reach a diverse, year-round audience, and is not necessarily intended for use in conjunction with a park visit (Henker & Brown, 2011). Henker & Brown's research concluded that this type of podcast was slightly less effective than a ranger-lead talk, but the difference was not statistically significant enough for institutions to discontinue investing in distance-podcast interpretation (Henker & Brown, 2011).

Interpretive podcasts can also be employed in conjunction with a visit to the physical site. The prospective visitor would first download the podcast onto her audio device (phone, ipod, or mp3). She would also be provided with a route map, in print or electronic form, or as panels at the site. For example, the Charlesbourg Historic Borough in Quebec City offers a series of podcasts for download, as well as a pdf route map (Quebec City Tourism, 2015). This form of interpretive podcast would simulate a guided tour of the site. Unfortunately, Henker & Brown's research did not assess the effectiveness of this style of podcast consumption.

Advantages	Disadvantages
Simulates a guide-lead tour, but at a lower cost	Requires the visitor to own an audio device
Environmentally and visually low-impact on the physical landscape	Requires the visitor to have planned the trip ahead of time and downloaded the podcast (if using it in conjunction with a site visit)
Potentially low-cost to set-up	If watching listening to the podcast from afar, the experience is somewhat removed and lacking in multi-sensory stimulation

Wifi, data, and cellular reception are not a problem	Downloading podcasts can be technologically challenging for some people
The listener can go at her own pace, and fast-forward/rewind/pause the podcast	
Can be provided multi-lingually	
(Henker & Brown, 2011); (Carter, 1997)	

Figure 34: Advantages and disadvantages of podcast media

# The [murmur] Project



[murmur] is an international oral history project, located in nine cities across the world ([murmur], 2015). People's personal stories and histories about a specific place or location are recorded ([murmur], 2015). A sign with a phone number (Figure 36) is then erected in that specific spatial location, and anyone with a cellular phone can call the number and listen to the story ([murmur], 2015). In this way, the landscape's stories are presented in a holistic fashion, highlighting the intimate link of place to experience. While [murmur] has generally been used to relate personal anecdotes and tales, re-creating history at the grassroots level ([murmur],

Figure 35: [murmur] sign

#### ([murmur], 2015)

2015), it could easily be adopted for different contexts. None of the

corridor's original inhabitants are still alive, but there are several knowledgeable individuals and historians who might be ideal candidates to fulfill the [murmur] storyteller role.

Advantages	Disadvantages
Only requires a mobile phone (not necessarily a more expensive smart phone with data capacities)	Requires cellular reception - may be problematic for areas with spotty coverage
Environmentally low-impact on the physical landscape	Need to find and recruit knowledgeable storytellers
Potentially low-cost to set-up	Damage and weathering to signs overtime
Technologically easy to manipulate for most people	Some visual impact (signage) on the landscape
Can be accessed any hour of the day	

Figure 36: Advantages and disadvantages of [murmur]

# Interactive maps

An interactive map is a web-based map that viewers can "interact" with through clickable icons and areas (Three Scale, n.d.). When clicked, information, videos, audio, pictures, or links appear, giving more information about the subject (Three Scale, n.d.). Point Pleasant Park's interpretation (discussed previously) has an interactive map component that users can access from their homes. As with most digital media, the cost to develop an interactive map can range from using a free online map-builder tool, to hiring a developer to customize the map.

Advantages	Disadvantages
Can be accessed any hour of the day, from home (for people with limited mobility or time)	May not be as engaging or multi-sensory as physically visiting the site
Environmentally low-impact on the physical landscape	Requires some technical know-how to set-up
Potentially low-cost to set-up	Requires access to a computer and internet
Can be edited an updated easily	
Can be multi-lingual	

Figure 37: Advantages and disadvantages of interactive maps

# Smart phone technologies: Map-based applications and augmented reality

Smart phone technology is a powerful and versatile tool that has recently been harnessed for a variety of interpretation purposes. In particular, the creation of map-based applications has become a popular tool for creating self-guided tours. These downloadable applications appear as a map interface, and link various forms of information—such as images, audio, and text—to spatial locations (The Hint Project, 2013).

The Geopark Shetland, in Scotland, provides a good example of this technology's potential interpretive applications. The park developed a map-based app to help guide visitors along a variety of themed walks, enriching the experience with detailed information and supportive graphics regarding the surrounding scenery (Shetland Amenity Trust, 2015). The app provides access directions for both vehicle and foot travel, and links with the phone's GPS system to notify users when they have reached the right spot (Shetland Amenity Trust, 2015).



Figure 38: Example of augmented reality (ZolkC, 2015)

The Geopark Shetland app also has an augmented reality feature (Shetland Amenity Trust, 2015), a separate but related concept to map-based tools. Augmented reality functions by using the visual sensors in a mobile phone's camera to track surroundings, usually in combination with the phone's GPS, to help pinpoint location (Byrne, 2014). It enhances the real world image (on a smart phone, in this case) by superimposing digital graphic layers over it (Figure 39), usually obtained using the phone's wifi or data connection (Byrne, 2014).

Both of these digital tools (map-based and augmented reality) can be obtained with a range of budgets. While a developer may craft an individualized product, there are also a variety of low-cost to free online resources (The Hint Project, 2013). These options are also good replacements for QR codes, like those found in Point Pleasant, which appear to be in the process of being phased out (Rosoff, 2011).

Advantages	Disadvantages
Versatile and editable, even once it is launched	The more technologically-complex something is, the more susceptible to glitches
Translatable to other digital forums (e.g. websites, social media etc.)	Requires access to a smart phone, which can be expensive
Can be low-cost to develop	Often requires access to wifi or cellular reception, which can be spotty in remote areas
Allows for a variety of media (e.g. audio, text, graphic) to be accessible in one place	The phone screens can be difficult to manipulate in the cold (with gloves on), or difficult to see in the sun
Low impact on the physical landscape	May be difficult to navigate for people who are not technology-savvy
Can be accessed at any hour	
Can be provided multi-lingually	
(The Hint Project, 2013)	

Figure 39: Advantages and disadvantages of smart phone technologies

# **Discussion: Possible interpretation media**

The first step in effective interpretation is to understand the subject being examined, and to organize it into themes and supporting stories. This is the content of the interpretation, and suggestions with regards to this were made previously. The second requirement for effective interpretation is the selection and use of suitable media to communicate content to an audience. There are many forms of interpretation media available, each with its advantages and disadvantages. The selection process should take into account the specific context and idiosyncrasies of the site or content being interpreted. Factors to consider may be environmental, political, or physical, among others.

In this section, opportunities and constraints for interpretation on the site, based on the environmental inventory and the realities of the corridor's current situation, will be identified. These opportunities and constraints will then be used to assess which forms of communicative media may be most appropriate for the historic industrial corridor.

# **Recommendations for interpretation media**

# A. Opportunities

Opportunities are characteristics of the site that lend themselves to interpretation.

# Pathways



Figure 40: Trail network that connects to the industrial corridor area

Map excerpt from Gray, 2005.

There are several pathways affording access to the site from Purcell's Cove Road. The old trail running parallel to Lawsons Creek is particularly well suited for encouraging full circulation through the corridor. Pathways and trails can be expensive and time-consuming to construct, so a preexisting network is beneficial for a potential interpretation plan.

There is also the potential to connect with other existing trails around Williams Lake and the area in general (Figure 41). The trail that leads from Purcell's Cove to the dam at Lawsons Creek continues south and eventually joins with a series of other recreational trails. There is also a small dirt path that runs along the shore of the Arm, starting at the Yacht Squadron and heading north towards the head of the Arm (not depicted in Figure 41).

## Greenbelting and riparian buffers

The corridor land is suited for inclusion into the future greenbelt network outlined in RP + 5. The area fits a number of the open space typologies outlined in the plan. Additionally, it is situated on the fringes of the city, and its designation as a protected open space would serve to limit further sprawl, which is one of the purposes of a greenbelt (HRM, 2015b).

Riparian buffer protection, which is being augmented while the greenbelting plan is developed, is also applicable to a large portion of the site. Both riparian buffer and greenbelting open space designations limit destructive development, but are permissive of cultural and recreation uses, such as non-disruptive interpretation (HRM, 2014c).

#### Cell phone reception

Due to its urban location, there is cell phone reception and access to data networks throughout the site. This opens the door for some technologically-dependent forms of interpretation.

#### Physical remains

There are some visible physical remains of the past corridor uses and materials, albeit subtle. Regardless, these remnants could be used as a jumping-off point for interpretation, and could be augmented and supplemented using various techniques.

# Interest groups

While knowledge of the corridor may not be widespread, there are various neighbourhood, heritage, and environmental groups who are concerned with the area. These groups may be interested in the history of the corridor, and would be willing to involve themselves with interpretation of the site.

#### Scenery and recreation

The corridor is situated in an attractive area, which offers many opportunities for outdoor leisure, such as walking or swimming in Williams Lake. Visitors who come to the area for recreation may participate in interpretation activities if they are available, even if that was not their original purpose. This could increase visitor numbers to the corridor, and allow them to combine their recreational experience with a cultural and heritage one.

#### **B.** Constraints

Constraints are considerations and physical features that prohibit or impede interpretation of the historic industrial corridor.

### Ownership and access

All the existing trails traverse private land, which is a limitation. Use of the trails to the north could possibly be argued for as public right-of-ways; it even appears that an easement may already exist for one. The northernmost privately owned parcel also appears to be public access, according to the property land registration papers (Access Nova Scotia and Municipal Relations, 2006). This route connects with the eastern side of Williams Lake, however, and not far enough south to reach the corridor site.

The possibility that the province or the municipality will purchase some of the area could ameliorate much of this constraint. However, it is doubtful that all of the owners of the various parcels over which the corridor runs would be willing to sell their land. While the future ownership of this area remains ambiguous, the full extent of this constraint for later interpretation is uncertain.

#### Climate change and the coastal environment

Due to climate change's potential impacts on coastal environments—such as sea-level rise, and increased severity and frequency of storms and storm surges (Forbes et al., 2009)—parts of the corridor immediately adjacent to the coast could be at risk. While HRM's riparian buffer development restrictions do not extend to lands designated Halifax Harbour (HRM, 2014c), it would be prudent, in the interest of costs to time and money that may be incurred through damages, to avoid constructing any intensive interpretation infrastructure too close to the water.

## Environmental sensitivity

There are several environmental factors that should be taken into account when implementing interpretation in this area. The bedrock geology poses hazards, such as the potential for radon exposure (Karrow & White, 1999), and acid run-off generated by the disruption of pyritic slate (HRM, 2011). While it is unlikely that radon will become concentrated to toxic levels, and residences in the area have (to my knowledge) never experienced problems, it is something to be aware of. Disruption of the bedrock is what precipitates radon and pyritic wash risk, so invasive interpretation forms (such as the construction of a visitors centre) should be limited.

The corridor ecosystem is also home to a number of rare species, and relies on a delicatelybalanced hydrological system (Hill & Patriquin, 2014). To prevent disturbance, interpretation media should not be overly intrusive (as discussed above). Increased foot traffic in the area could also have repercussions for a sensitive environment.

#### Pathways

While the presence of pathways is an opportunity (discussed above), their specific characteristics can pose challenges. As the trails in the area are informal, they are neither paved nor maintained. The terrain is rocky and uneven, and may pose challenges for those with limited mobility. Additionally, Lawsons Creek has a cooler eastern-exposure, which can contribute to reduced trail quality in the winter. Snow and ice accumulation during these months may make traversing the paths surrounding the corridor treacherous.

There is no public parking where the trails connect to Purcell's Cove Road. The Nova Scotia Yacht Squadron clubhouse has a parking lot, and is relatively close, but it is unlikely that the club would allow the public to use it. This matter is further complicated because there are no sidewalks lining Purcell's Cove Road. Accessing the trail heads may involve a treacherous walk on the road's narrow shoulder.

#### Funding

The cost of implementing an interpretation plan is always a consideration (Carter, 1997), and will vary depending on the medium used. Due to its currently unrecognized status as a cultural and heritage asset, funding for interpretation of the historic industrial corridor has not been considered by any large institution at this time. Currently, it seems as though any move to implement an interpretation plan would be made by smaller interest groups with limited resources.
### Wi-fi access

While there is access to cellular reception, the internet can currently only be accessed by those with data capabilities on their mobile devices. Data can be costly, and many individuals are unwilling or unable to pay for it. Additionally, it requires the platform of an expensive mobile or tablet device. To access interpretation using certain hi-tech media methods, visitors would either have to have the foresight and preparedness to download applications prior to visiting the site, or be willing to pay for cellular data access.

### C. Comparison of suggested media

Each proposed interpretation medium (discussed previously) has unique strengths and limitations that determine the circumstances in which it is most effective at communicating interpretation content to visitors. In order to understand which media are best suited to interpreting the particular scenario of the corridor, each has been assessed against the identified site constraints and the suggested interpretation themes.

Figure 42 compares the attributes of the various media options to the constraints imposed by the industrial corridor site. Funding has not been included in the table because cost was considered when selecting possible methods. All of the selected media can be implemented at minimal cost.

Constraints	Panels, signs, & models	Podcasts	Interactive Maps	Smart phone technologies	[murmur]	Pamphlets
Affected by limited site access	Yes	If used in conjunction with a site visit	No	Yes	Yes	If used in conjunction with a site visit
May disrupt a sensitive environment	Potentially through increased foot traffic	If used in conjunction with a site visit	No	Potentially through increased foot traffic	Potentially through increased foot traffic	If used in conjunction with a site visit
Quality of trails may be a problem	Yes	If used in conjunction with a site visit	No	Yes	Yes	If used in conjunction with a site visit
Would benefit from onsite wi-fi access	No	No	No	Yes	No	No

Infrastructure	Yes	No	No	No	Yes	No
vulnerable to						
weather						
damage						

Figure 41: Comparison of media against constraints

The interactive map, the stand-alone podcast, and the pamphlet (not onsite) are the media options that conform best to the constraints of interpretation for the corridor site. This is because they are activities that do not physically take place on the site. In many ways this is a limitation itself. Interpretation experts widely agree that audiences are more engaged by physically immersing themselves in a multi-sensory experience of the place being interpreted, and come away with stronger impressions and a greater appreciation of the place (Tilden, 1957; Ham, 1992; Schorch, 2012). Studies have also supported these assertions (Henker & Brown, 2011; Powell et al, 2012). Taking this into consideration, I would recommend that these options not be the primary forms of interpretation, if possible. Rather, they should be viewed as supportive or complementary methods to other forms of more engaging media. These methods are, however, useful for people with limited mobility, or when site conditions are not navigable due to inclement weather. The one instance where these media forms may be most appropriate as the primary means of interpretation is if the corridor site is not brought into public ownership, and remains inaccessible due to private ownership constraints.

If at least part of the corridor land is brought into public ownership, onsite media will provide more effective interpretation. These media forms (panels, onsite pamphlets, onsite podcasts, smart phone applications, and [murmur]) face many of the same challenges posed by the site. All of these methods have some potential for a small amount of environmental disruption because of increased foot traffic. They also require some mechanism that allows for circulation throughout the site. Thus, poor trail conditions can affect the ability of visitors to partake in these forms of interpretation.

These options all have pros and cons, and it is difficult to definitively recommend one over the others. Smart phone applications probably offer the richest possibilities for a multi-sensory (audio, graphic, textual) experience, and have no interpretation infrastructure requirements. This approach does, however, put more of the onus on the visitor, either to come prepared with a downloaded app or to be willing to spend money on data during the site visit. Smart phone applications also require the visitor to have a certain level of technological knowledge, which may make this method inaccessible for some.

Panels and pamphlets are the simplest media to develop. Panels require some infrastructure to be put in place. While both options are accessible to the average person, they are generally less

engaging methods. The static information offered by panels (on account of the work required to update them) in particular may become dull to people who visit the site often.

In contrast, [murmur] and podcasts can easily be updated to keep interpretation fresh for regular visitors. They also have very little physical impact on the site. These media do require only basic technological skills to use and are accessible to the average person. Additionally, sophisticated and well-designed audio can create a poignant sense of the experience being interpreted, even in the absence of visuals. According to Tilden, as well as succeeding theorists and researchers in the field, the more immersive interpretation is, the more effect it will have on visitors.

Each proposed interpretation theme has unique characteristics that may be suited to a particular type of medium. Figure 43 assesses each interpretation method against the suggested interpretation themes. Theme one is very place-specific; a multi-sensory interaction with the environment being discussed is an effective way to instill understanding in visitors. Graphics may also be useful when explaining environmental processes. This theme would benefit from onsite, visually-oriented interpretation media, such as smartphone applications.

Interpretation themes	Panels, signs, & models	Podcasts	Interactive Maps	Smart phone technologies	[murmur]	Pamphlets
Theme one: The relationship between the natural environment and industry	<i>Suitable:</i> on- site (can fully experience the environment being discussed), and can provide visuals of the vanished industries and environmental processes to complement the site visit; limited space for explanation	<i>Somewhat</i> <i>suitable:</i> best if combined with a site visit; lacks the ability to graphically illustrate physical and scientific processes (which do not lend themselves well to dramatization)	<i>Suitable:</i> visual connection of space and industry; able to explain (graphically and textually) scientific processes; but removed from the multi- sensory experience of the environment being discussed	<i>Very suitable:</i> on-site, and could be used to visually connect the place to the vanished industry through augmented reality, and also graphically explain environmental processes	Somewhat suitable: on- site, although it lacks a visual connection between vanished industry and the environment, and lacks the ability to graphically illustrate physical and scientific processes	<i>Suitable:</i> on- site, and can provide visuals of the vanished industries and environmental processes to complement the site visit, although space is limited
Theme two: The relationship between the	<i>Somewhat</i> <i>suitable:</i> can communicate some	Very suitable: can communicate complex and	<i>Less suitable:</i> this theme does not revolve	<i>Less suitable:</i> this theme does not revolve	Very suitable: can communicate complex and	<i>Somewhat</i> <i>suitable:</i> can communicate complex and

global and the local site	complex and abstract stories, although space is limited and it is difficult to create drama and engagement	abstract stories, and can use dramatic sounds and language to bring past events (human history) to life	around specific spatial locations in, or visual elements of, the site, so map-based technologies are less applicable	around specific spatial locations in, or visual elements of, the site, so map-based apps are less relevant	abstract stories, and can use dramatic sounds and language to bring past events (human history) to life	abstract stories, combined with visuals, although space is limited, and it is difficult to create drama and engagement
Theme three: How the nature of industry and its relationship to local place has changed over time	<i>Somewhat</i> <i>suitable:</i> can connect themes to the specific site spatially, but limited space to communicate complex and abstract stories	<i>Very suitable:</i> can communicate complex and abstract stories in detail and with drama, but lacks a visual component that may be advantageous in illustrating new technologies	<i>Suitable:</i> can communicate broad stories and themes as they relate to a specific spatial location, and can provide detail and visuals on complex technologies and stories	<i>Suitable:</i> can provide communicate broad stories and themes as they relate to a specific spatial location, and can provide detail and visuals on complex technologies and stories	Very suitable: can communicate complex and abstract stories in detail and with drama, but lacks a visual component that may be advantageous in illustrating new technologies	<i>Somewhat</i> <i>suitable:</i> can connect themes to the specific site spatially, but limited space to communicate complex and abstract stories

Figure 42: Suitability of media for each interpretation theme

While it is generally preferable to have an onsite interpretation experience, theme two is less site specific and would lend itself better to off-site interpretation than theme one. This is because many of the global events that are central to this theme are not directly visible on the corridor land. This theme is concerned with human stories, such as wars and immigration, which can be presented theatrically to engage audiences. Audio methods such as [murmur] and podcasts (onsite or off) can use sound and intriguing language to create drama and excitement, while also exploring abstract and complex concepts in more detail than panels or pamphlets permit.

Theme three is a broad theme that is relevant to the entire era of the industrial revolution. It can, however, be applied to specific spatial locations on the corridor site through an exploration of the evolution of the various industrial activities there over time. Onsite interpretation that can offer detailed explanations of the abstract and complex components of this theme, such as [murmur] and podcasts methods, are recommended.

## Conclusion

This research used a multi-faceted approach to understand the historic industrial corridor that used to follow Lawsons Creek. The findings informed strategic recommendations for interpretation. I undertook an inventory of the site's environmental features and an exploration of the larger human history and the micro-history of corridor activities. I used the data to suggest themes and narratives that would provide the structure and content of an interpretation plan. An investigation was also conducted into the extent of the physical remains of the corridor, the area's modern day situation and form, relevant policies and legislation, and possible media. I synthesized the findings to identify opportunities and constraints for interpretation, and to formulate recommendations for appropriate media. While it is not the purpose of this project to implement these findings, this proposed plan or any of its constituent parts may be used by interested bodies to inform future interpretation ventures.

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## Appendices

APPENDIX A: The corridor site over time	A-1
APPENDIX B: Land re-survey of lots A & B	A-3
APPENDIX C: Development exceptions permitted within riparian buffers	A-4

## Appendix A: The corridor site over time







A - 3

# Appendix C: Development exceptions permitted within riparian buffer zones

While development is generally prohibited in riparian buffer zones, the following uses may be considered as exceptions, pending municipal approval:

- Water control structures;
- Boardwalks, walkways, and trails of a limited width;
- Fences;
- Public road crossings and driveway crossings;
- Wastewater, storm, and water infrastructure;
- Marine dependent uses;
- Fisheries uses;
- Boat ramps and wharfs;
- Small-scale accessory buildings or structures, and attached docks;
- Conservation uses;
- Parks on public lands; and
- Historical sites and monuments.

#### (HRM, 2014c)

Further to the above exceptions, RP + 5 dictates that where such uses may be approved through development agreement, HRM will investigate acquiring the riparian buffers involved for use as public open space (HRM, 2014c).