Brock University Niagara Community Observatory

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A History of Marine Transportation in Niagara, Pre–1969

Introduction

Marine transportation has transformed the Niagara region and remains a vital component of economic development. It laid the foundations for commerce, settlement, and expansion of the region, and it continues to be a conduit for change, renewal, and advancement. Canalization and other marine infrastructure have improved navigation while facilitating transportation networks that remain crucial to regional, national, and international supply chains. In addition to significant achievements in shipping and canal infrastructure, Niagara has also been a strategic centre for boatbuilding, shipbuilding, and repair, contributing to and supporting commercial and recreational watercraft, through its evolving shipyards, dry docks, and associated facilities.

Today, Ontario's economy remains heavily dependent on its waterways. The province's new marine transportation strategy endeavors to shape domestic policies and partnerships, improve multimodal networks, modernize existing infrastructure, incentivize economic growth and competitiveness, while providing training opportunities.[1] Interestingly, these types of initiatives have been shaping the province's marine transportation developments since its earliest beginnings in 1787. This strategy appeals to modern directions, by embracing changes to reduce carbon emissions, integrate new technologies, and greening the marine transportation sector. It demonstrates the incorporation of new values that will ensure marine transportation remains competitive while still environmentally sustainable for future generations.[2]

Toward understanding the foundations that paved the way to modern developments, this paper will explore the historic character of marine transportation in Niagara. Through demonstrating how these early developments led to current trends, it examines factors that shaped the region's waterborne developments, and which continue to inspire manufacturing and shipping operations. Marine transportation spurred growth in boat and shipbuilding, creating demand for labour and skilled employment across the region. Through initial developments on the Niagara River, and later along the Welland Canal, productivity and competitiveness in the marine sector have remained at the core of Niagara's economic development for over 200 years.

Early Context and Developments

Human migration and occupation of the Niagara region began 13,000 years ago. The formation of this landscape, after the retreat of the glaciers, and at the confluence of Lake Ontario, Lake Erie, and the major rivers and streams, would have supported a range of fishing and hunting practices. As a subsistence economy, access to offshore resources and participation in long-distance trade were crucial to survival and spurred the construction of watercraft to meet the needs of local bands.

The region's forest resources, particularly white pine and white birch, provided sufficient materials for their construction. The dugout canoe, and later the birchbark canoe which superseded the dugout due to its performance and portability, were built and employed along the region's various water courses. They linked a vast system of water routes and overland trails that were essential to connecting trade networks across the peninsula. These watercrafts remained crucial to Niagara's Indigenous Peoples, connecting its communities, and supporting transportation systems through post-European contact.

The significance of Niagara's waters, and its centrality to human settlement and economic development of the region, is embodied in name. The word "Niagara" first appears on European maps in the form Onguiaahra, in the writings of Jesuit priest Jérôme Lalemant, in 1641, with its principal interpretations both involving water.

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The first with reference to Niagara Falls is "thundering waters" the second referring to the Niagara River is "neck," denoting the strip of water connecting the "head" and the "body" (Lake Erie and Lake Ontario).[3]

Indigenous Peoples supported Niagara's early explorers and settlers, during periods of peace and war. After the American Revolution, they would be displaced by the Upper Canada Land Surrenders, and their lands and waterways settled by the Loyalists. Indigenous communities were forced to relocate to areas near the Grand River, which afforded access to water routes and arable land.[4]

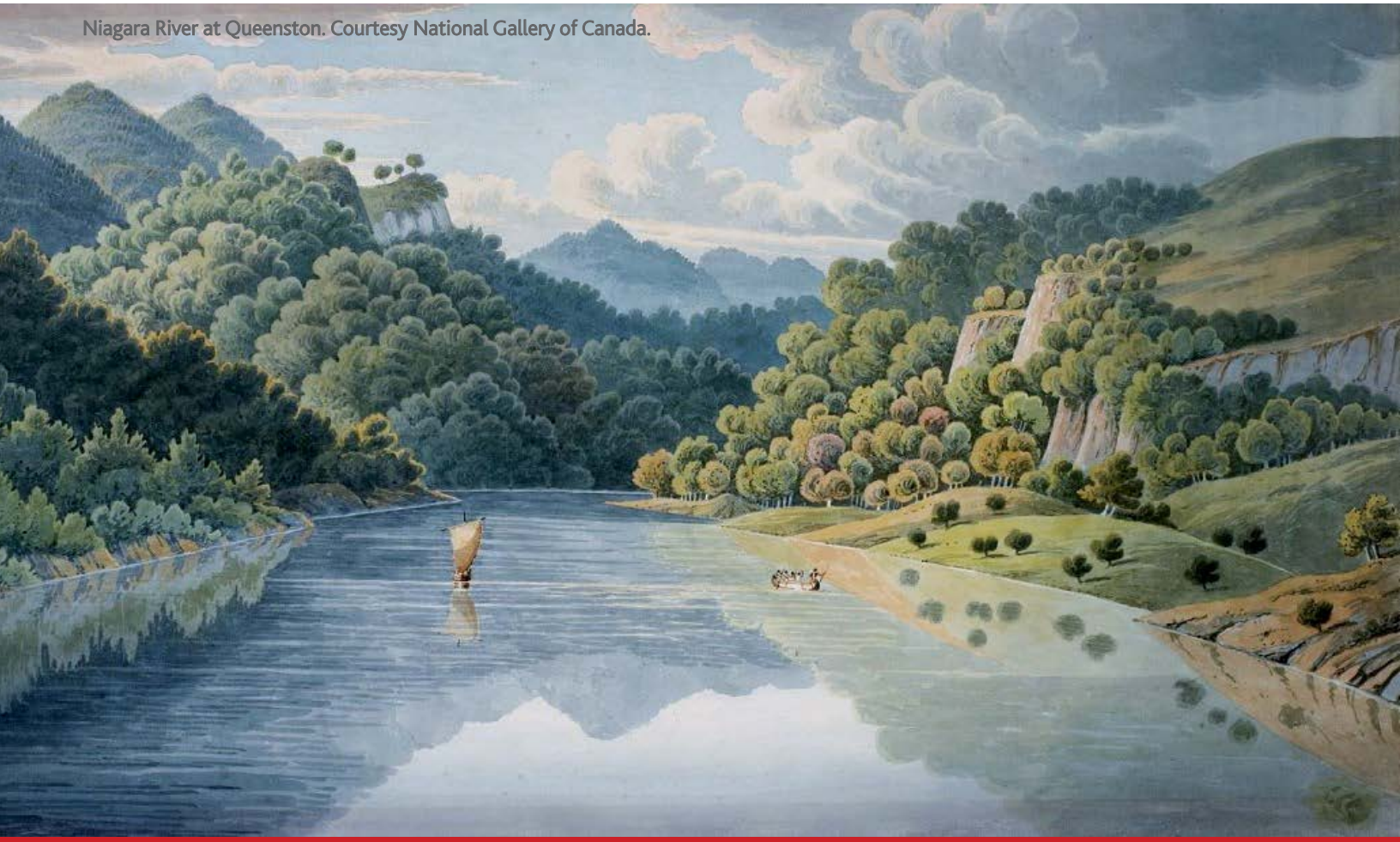
The early Europeans that explored the Niagara Peninsula travelled with their Indigenous guides in birchbark canoes. Niagara became a key transit point along a principal water route that connected Montreal with the pays d'en haut—territory that was crucial to the French and later English fur trade. The route ascended the St. Lawrence River through Lake Ontario and Lake Erie, passing by Toronto, Niagara, Detroit, and through the Straits of Mackinac. Canoes remained crucial to this route, for early exploration and settlement of the area. The requirements for transporting increasing volumes of cargoes, to support trade and settlement, led to French construction of the first European ships on the Great Lakes.

The first documented ship to arrive at Niagara was the 26-ton *Le Brigantin* built at Fort Frontenac (Kingston) in 1676. Father Louis Hennepin, a Franciscan missionary, wrote briefly about the ships' arrival at the mouth of the Niagara River on January 6, 1679:

> *On the 6th, being St. Nicholas's Day, we got into the fine River Niagara, into which never any such Ship as ours enter'd before. We sung there Te Deum, and other Prayers, to return our Thanks to God Almighty for our prosperous Voyage.*[5]

Although the French would position their trading post(s)[6] on the east bank, this event sparked a trade network on the Niagara River that would drive the region's early marine economy.

French shipbuilding efforts were primarily concentrated on the Niagara River at Fort Niagara and above Niagara Falls near the entrance to Lake Erie at Navy Island. French naval shipbuilders manufactured several decked ships, in addition to smaller watercraft such as batteaux, to maintain trade and communication between French forts on lakes Ontario, Erie and the Upper Lakes. The Seven Years' War would result in the loss of French control on the Great Lakes, with the British now controlling shipping and manufacture in the Niagara region.



Niagara River at Queenston. Courtesy National Gallery of Canada.

The Treaty of Paris in 1763 ended the war and led the British government to focus its effort on improved transportation and communication across the region. Agriculture, manufactured goods, and military supplies were sent through Niagara, transported overland to the head of the falls. A capstan (rope) incline was constructed from which a wagon portage, about six miles long, was used to carry batteaux and merchandise along the east side of the Niagara River. Limited cargoes were also transported above the falls on privately-owned ships and Provincial Marine vessels before 1774.[7]

During the American Revolution, trade was limited to government vessels which led to increased military shipbuilding to support commercial interests.[8] The Provincial Marine Naval Shipyards at Navy Island, Navy Hall (located at Newark in 1792, renamed Niagara in 1798, and Niagara-on-the-Lake in 1898) and later Chippawa, facilitated commercial transport while supporting offshore and military efforts.

The Treaty of Paris in 1783 officially ended the Revolutionary War and set new territorial boundaries with British land cessations along the east bank of the Niagara River. This led to the construction of a new overland route, referred to as the Niagara Portage, to connect British supply lines between lakes Ontario and Erie. The portage followed the Indigenous trails on the west side of the Niagara River and became a critical supply line for commercial and military purpose. Ships could navigate to Queenston where they discharged cargoes, which were then carted overland to Chippawa or Fort Erie, and loaded on ships for the Upper Lakes.[9]

A series of wharves and docks were constructed on the west side of the Niagara River, to support increased shipping along the portage route. To meet the needs of military action and commercial interests, British naval shipbuilders manufactured a variety of ship-types shaped by the local geography. Several sloops and schooners were built with sufficient tonnage for the carriage of passengers and freight, while smaller watercraft fitted with oars and sail would have facilitated transport along the many creeks and rivers and enabled quick shore access. These included fleets of batteaux that were employed on amphibious attacks, as well as Durham boats used for moving commercial goods. Oak and pine timber was carefully selected and cut by Master Shipwright John McFarland, who took charge of the batteaux service at Newark.[10] Indeed, Niagara's forests became an important resource in Niagara, while supporting commercial and manufacturing developments after 1787.

Early Foundations of Marine Commerce

In 1787 a series of ordinances were passed towards improving commerce on the lakes. The first act promoted the import and export of merchandise free of duty, for the "further increase and encouragement of shipping and navigation."[11] The second removed the transport restriction to Provincial Marine vessels, thereby encouraging private shipbuilding, with vessels limited to 90 tons. The quick progress of private shipbuilding was considered of sufficient importance to expedite the appointment of John Warren as superintendent for its enforcement at Fort Erie.

The formation of Upper Canada in 1791 encouraged the new province to take charge of its commercial development. Townships were required to be situated on a navigable river or lake for the accommodation of the settlers, which supported the erection of further wharves to facilitate shipping.[12] Importantly, the Legislative Assembly established a series of ports to connect the region's transportation networks. The transshipment points along the Niagara portage were among the first ports of entry in the new province. This facilitated the collection of customs revenues, thereby increasing provincial income.[13]

The original act of 1801 provided for 11 ports, including Queenston and Fort Erie, which opened on July 9, 1801.[14] Within a year, further ports were required, resulting in the addition of Chippawa. Additional customs ports were established through the 19th century coinciding with new routes and increased tonnage, to support the expansion of trade. The Collectors of Customs were required to reside within a convenient distance of the Custom House, which in turn led to constructing buildings for habitation, as well as wharves and storehouses to support the flow of ships and goods.[15]

Having established a system for collecting revenue, the province was then able to allocate funding to support marine infrastructure, toward protecting shipping.[16] The first lighthouse to operate on the Great Lakes was sited at Mississauga Point in 1804, to enable the Lake Ontario trade with the Niagara River. The light was however short-lived. Demolished in 1814, the location was cleared for Fort Mississauga. No further navigation lights were installed by British interests in the region until the early 1830s.

The War of 1812 would halt further developments for navigation. The peninsula was central to the British lines of communications to the interior, with the Provincial Marine tasked with ensuring its protection. From its base at Niagara, it provided a crucial transport service, helping to sustain the army, and thwart invasion attempts at Queenston.

Improvements in wharf facilities to support the batteaux service were particularly vital during the War of 1812, to convey supplies, equipment, and reinforcements to land forces at Niagara. The networks of transportation that were improved or expanded to support the war effort would expedite commercial trade developments after 1815.

The challenges facing British and American interests to maintain separate fleets during the American Revolution and the War of 1812, combined with the difficulties of moving greater volumes of cargo to supply the rising population, pressed the need for a canal across the peninsula. While proposals were raised shortly after the American Revolution, with only three dozen ships trading on the lakes, the urgency for a major engineering undertaking had limited financial support. Reconstruction after the War of 1812, led to provincial investment to benefit both industry and infrastructure.

Trade and Navigation on the Niagara River

Upper Canada's population grew rapidly after 1815, increasing at a rate of nine per cent per year before 1825. Lincoln, the name under which the region operated at this time, held the largest population within Upper Canada.[17] Post-war reconstruction combined with Niagara's role as an entrepôt on the St. Lawrence-Upper Lakes trade route, increased opportunities and, in turn, immigration. This fuelled the need for commodities, which, if they couldn't be grown or made locally, had to be shipped.

The establishment of shipping lines coincided with commercial development to support the growing province. Initially schooner-rigged vessels, fitted with two masts and weighing between 30 and 100 tons, became the "workhorses" of marine commerce, transporting both passengers and freight. Beginning in 1816, schooner packet services were instituted between Niagara and other commercial ports on lakes Erie and Ontario. In March 1816, a twice-weekly service aboard the schooner *Asp*, travelling between Fort George (Niagara) and York (Toronto), was inaugurated by William Fish, a merchant at Queenston.[18] Advances in technology would further shape the commercial development on the Lakes.

The Industrial Revolution in Britain spurred the invention of the Boulton and Watt engine. That led to the first steamships on Lake Ontario in 1816, and on Lake Erie in 1817.[19] The first steamship service to Niagara began in 1817 aboard the steamboat *Ontario*, travelling from Sackett's Harbor and Ogdensburg, NY.[20] The first service running to Niagara from British-Canadian ports began in 1825 with the steamer *Toronto*, running between York and Niagara.[21] The steamer *Canada*, launched the following year, was owned and operated by Captain Hugh Richardson from Niagara. By 1828, the first steamship line, the "Lake Ontario Canadian Line of Steamboats," was running between Prescott and Niagara.[22] The proprietors were brothers Robert and John Hamilton of Queenston, and the line was the first on the Canadian side to run vessels on complementary schedules. Their success stimulated steamboat construction at Niagara, Queenston, and Chippawa.

The Battle of Queenston, 1813. Courtesy RiverBrink Art Museum.

Coinciding with these technological developments, the government initiated the first formal hydrographic survey of the waters around Niagara. This was undertaken between 1815 and 1818 by Royal Navy Lieutenant Henry Bayfield, under the direction of Captain William Owen.[23] Further improvements to marine charts for the Niagara region would be published in 1828, coinciding with the First Welland Canal, thereby supporting the increase in marine shipping.

The depression of 1819 would cause severe financial strain, leading to the end of the North West Company and the St. Lawrence fur trade in 1821. During this time, land clearing and farming proceeded apace the rising population, with wheat becoming the key export, sold for both local consumption and export.[24] A dozen or more mills had operated on the creeks across the Niagara Peninsula since the 1780s, producing flour that was shipped on batteaux or Durham boats for transhipment at Niagara or Queenston, for the St. Lawrence River or the Upper Lakes.

Before the first bridges were built to convey people across the Niagara River, ferry services were established at several locations. They initially employed oared watercraft, but after 1824, horse-powered ferries or steamboats would provide daily service between Niagara and Youngstown, Queenston and Lewiston, Clifton (Niagara Falls, ON) and Niagara Falls, NY, Waterloo (North Fort Erie) and Black Rock (Northwest Buffalo), and Fort Erie and Buffalo Creek (Buffalo).[25] Ferries also served more nefarious purposes, enabling smuggling activities across the river, particularly between Niagara and Lewiston, and Fort Erie and Black Rock.[26]

The development of ferry services at Niagara Falls would lead to the development of ship-based tourism at Niagara Falls. Beginning in 1846, 11 successive generations of the *Maid of the Mist* led millions of people to this popular tourist destination. The ships' technology transitioned from steam to diesel power and, today, two electric-powered vessels continue passenger services to the base of the falls.

Maid of the Mist, n.d. Courtesy Brock University Library Archives and Special Collections.

Communities and Labour

Early settlement along the river consisted of British soldiers, United Empire Loyalists, and their families. Labour was initially directed at military and domestic building work, including fortifications, storehouses, and supporting structures to facilitate navigation. The establishment of custom ports beginning in 1801 would support communities along the Niagara Portage at Niagara, Queenston, Chippawa and Fort Erie. Dozens of businesses that include shipping agents, general shops and chandleries (marine supplies), liveries (horse stables), and hotels, were established along the route, providing services to facilitate the movement of goods and people.

After the War of 1812, the population increased rapidly, which spurred local industry, new mercantile activity, and labour mobility. The demand for water-powered industries such as grist and sawmills surged between 1826 and 1829, increasing by 12 per cent and 16 per cent respectively.[27] Industries contributed to the growth of shipbuilding while also facilitating Niagara's marine export trade for agricultural products. By the late 1830s, the Niagara Harbour and Dock Company employed between 150 and 350 workers—the busiest shipyard and repair facility in Upper Canada.[28] These developments increased local shipping, while also attracting skilled and unskilled labourers, including sailors, stewards, engineers, and machinists, to support marine operations.

The proposed Welland Canal met with opposition for financial and political reasons from settlers along the Niagara Portage whose businesses would suffer from the diversion of trade.[29] Initially, the canal was routed by way of the Welland River to Chippawa, which, combined with a reduction of tolls to match those on the Welland Canal, kept the route competitive. The opening of the terminus at Port Colborne in 1833, to avoid "reliance on the dangerous and inconvenient navigations of the Welland and Niagara Rivers" would thereafter limit benefits to Chippawa and Fort Erie by way of the canal.[30] Efforts to offset the loss included construction of the Erie and Ontario Railway (connecting Chippawa and Queenston), providing opportunities for employment in construction, maintenance and operation along the route. The route was completed in 1841 and rebuilt in 1854 with steam replacing horses. It was renamed the Erie and Niagara Railway and was later absorbed by Canada Southern, providing passenger services along the portage until 1925.

The changing role of the lower Niagara River, from a merchant-forwarding district to its growth as a tourist destination, promoted a range of new business opportunities that supported the communities at Niagara and Queenston.

The growth of steamship lines in the 1840s ensured a steady tourism trade with Toronto and other Lake Ontario ports through the 1950s, while also facilitating the export of Niagara produce. Niagara would host yachting regattas beginning in the 1870s, which further encouraged investment in local harbour facilities and support local business.[31] Canoes and boat rentals for fishing increased in popularity by 1900, with several boathouses providing water-based recreation for tourists and locals. And by the 1940s, investment in local boat manufacture would induce a significant influx of labour to support the escalating recreational boating industry.

Rowboat rentals were popular at Niagara-on-the-Lake at the turn of the 20th century. Courtesy Niagara-on-the-Lake Museum.

Manufacturing and Repair on the Niagara River

The shipbuilding industry in Niagara was initially slow to develop. Before 1812, several single- masted sloops and schooners were constructed by private enterprise along the Niagara River, to support the shipment of goods. The lack of skilled shipbuilders, however, proved challenging and required hiring shipwrights on contract. In 1810, Niagara businessmen William and James Crooks invited Black Rock (Buffalo) shipbuilder Asa Stanard to build the schooner *Lord Nelson*, for the carriage of freight between Upper Canadian ports.[32]

Following the war, Niagara became one of the busiest ports on Lake Ontario, and by 1823, would have its first resident merchant shipbuilder. Amos Roberts constructed several steamers and repaired dozens of ships at Queenston and Niagara before 1831, to support commercial and passenger services on Lake Ontario.[33] Although the speed of the early steamships remained limited, these technological advances would soon encourage a new direction for shipbuilding and related manufacture in the region.

The first major investment in shipbuilding in the Niagara region was the incorporation of the Niagara Harbour and Dock Company in 1831. Its efforts led to construction of a harbour, wharf, and a wet dock, and later, a steam-powered marine railway and engine foundry at its Niagara facility.[34] Between 1831 and 1864, several shipbuilders would be employed, or would lease the facilities, to construct vessels built primarily for the Lake Ontario or St. Lawrence trades.[35] Competition for the expanding passenger services on Lake Ontario led to substantial orders during the 1840s. For vessels that could not fit through the canal, it became the primary repair facility before 1845. Its docking and wharfage facilities spurred several subsidiary businesses including forwarders, ship brokers, and commissioning agents.

By 1839, the company received government contracts to build several steam-powered warships on Lake Erie, which led to a new facility at Chippawa in 1840. A series of banking failures and increasing debts would place the company in financial distress beginning in 1841, forcing the company into insolvency by November 1848. The Chippawa facility was seized and sold at auction in August 1850, while the Niagara facilities were leased until 1853.

Samuel Zimmerman would take control of the Niagara dock facilities in October 1853, as well as purchasing its Chippawa facility to expand his transportation investment with the Erie and Ontario Railway.[36] Zimmerman contracted St. Catharines-based Louis Shickluna who would build at least five additional vessels at these locations, including the paddlewheel steamer *City of Toronto*.[37] The impact of railways, and competition with luxury steamboats on lakes Erie and Ontario, would end further manufacture after 1864.[38] The wharf facilities, however, continued to be used through the early-20th century to support passenger services on Lake Ontario.

THE FIRST WELLAND CANAL ERA, 1829

The development of canal systems connecting the interior of North America with the ocean, was one of the most important engineering initiatives during the 19th century. The ability to ship bulk goods, the products of agriculture, forests, and mines, was essential to sustain the continent. The War of 1812 had demonstrated the strategic need for a canal across the Niagara Peninsula, the lack of which had meant the laborious transport overland of military supplies as well as the maintenance of separate fleets on lakes Ontario and Erie. At the same time, events had shown that naval supremacy on the lakes was indispensable to military success on land.[39]

Beginning in 1818, the legislature was in receipt of a series of petitions by members of Parliament, on the need for a canal "…to capture the trade of the American Midwest and

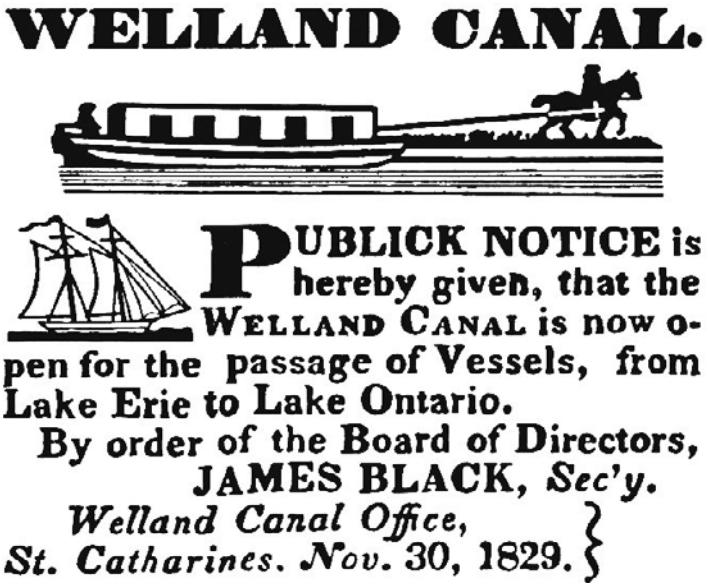
western Upper Canada."[40] This "matter of great national importance" was not limited to imperial strategists.[41] It was also of immediate importance to the agriculturalists and merchants of Upper and Lower Canada. Inland navigation was essential to the prosperity of both provinces during times of peace and to their security in times of war. Adding to these pressures, by 1821 American efforts to connect Lake Erie by way of a canal to the Hudson River were well underway.[42] Further appeals to the legislature, to emphasize the importance of undertaking this major public work project were initiated:

> *The great and indeed only efficient measure by which … a permanent relief can be afforded to the commerce of Upper Canada, and the safe, easy, expeditious, and economical exportation of our staples to the markets to which we have access can be secured, is the improvement of our inland navigation.*[43]

The canal was forged out of the region's natural waterways and largely protected by the Niagara Escarpment. Early shipping along these waterways was undertaken by United Empire Loyalist merchants and millers, prior to 1828. Batteaux or Durham boats would have facilitated shipment of flour and other agricultural products down these waterways, with transshipment at Niagara for either Lake Ontario or Lake Erie.[44] The hazards of shoals and limited depth of water on these creeks would have further pressed the need for improved navigation.

A joint stock company was formed in 1824, initiated by William Hamilton Merritt, for the purpose of creating a navigable waterway across the peninsula. Work began on the project in November 1824, with the water course from Port Dalhousie to Chippawa and the Niagara River completed by 1829. The Lake Erie terminus at both Port Maitland and Gravelly Bay (which became Port Colborne in 1832) was completed by 1833. The canal consisted of 40 wooden locks over 44 kilometres (27 mi). While the canal was crucial to ship navigation between lakes Erie and Ontario, it also provided a source of waterpower through hydraulic raceways, enabling manufacturing processes. Water rents were charged to canal businesses, providing additional income to offset the costs for operating and maintaining the first and second canals.

Shipping steadily increased during the period of the first canal. Tolls were charged for vessels carrying agricultural and forest products, while ships not breaking bulk (unloading) could pass freely.[45] Schooners were able to perform trips from Cleveland to Oswego, NY returned and unloaded, within 10 days; and from Port Dover to Toronto in three days.


WELLAND CANAL.

PUBLICK NOTICE is hereby given, that the WELLAND CANAL is now open for the passage of Vessels, from Lake Erie to Lake Ontario.

By order of the Board of Directors,
JAMES BLACK, Sec'y.

Welland Canal Office,
St. Catharines. Nov. 30, 1829.

Advertisement in *The Farmers' Journal*, and *Welland Canal Intelligencer*, St. Catharines, December 2, 1829.

The Welland Canal Company benefitted from annual toll revenue, which from 1833-34 was 19 per cent, and in 1834-35 increased to about 35 per cent.[46] Passenger services through the canal during this period had also significantly increased by 75 per cent. To celebrate the success of shipping that engaged in the bulk-forwarding trade, the company began to offer a premium of $100 to the first ship of the season that passed through the canals with cargo from Lake Erie to Ontario.[47]

Communities and Labour

Construction of the First Welland Canal initially attracted essential businesses to serve the growing communities, including blacksmiths, carpenters, masons, and general labourers.[48] This led to the expansion of small villages along the intended route during construction. While some of these communities were initially settled by United Empire Loyalists in the late-18th century, English, Irish and Scottish immigration surged after 1825 as the canal project gained momentum.

St. Catharines was initially the main centre for activity along the route, but by 1828 canal communities would form at Port Dalhousie, Thorold, Merritton, Allanburg, Port Robinson, Welland and Port Colborne, to support canal construction and for the manufacture of local infrastructure.[49] Port Dalhousie would expand quickly, and by 1831 had begun to attract significant capital. The construction of houses and stores, granaries, and a wholesale store supplying British goods, provided support to those transiting and living along the canals.[50]

Settlements also developed along the feeder canal at Wainfleet, Marshville, Dunnville, and Maitland. The routing of the canal to Port Colborne by 1833, would limit transportation impacts from communities along the feeder, and by the late 1860s, Dunnville and Maitland would be subsumed within the Haldimand District.[51]

The prosperity from the Welland Canal also led to new community enterprises along the shores of Lake Ontario. The Grimsby Breakwater Pier and Harbour Company and the Louth Harbour Company were incorporated in 1835, which stimulated an active freight trade with these villages.[52] The routing of the Great Western railway bridge over 20 Mile Creek, led to the founding of Bridgeport (later Jordan Station) as a centre for commercial storage and shipping of agricultural products, a trade that continued through the early-20th century. Grimsby supported commercial freight, while also becoming a key tourist destination, with passenger services from Toronto and Hamilton by the 1870s. A rise in passenger steamships led to its development as a summer resort and amusement park by the early-20th century.

Grimsby Pier, n.d. Courtesy Grimsby Historical Society Archives.

Unemployment, labour strikes and unions would evolve throughout the period because of sporadic jobs, low wages and poor conditions. Initially, First Welland Canal construction provided several thousand jobs for unskilled labourers, but after the canal was built, the work was casual and seasonal due to the requirements of navigation.[53] Class tensions, racial hatred, and discrimination became a powder keg within the predominantly Irish canaller communities. According to the *St. Catharines Journal*, in 1844, there were four major strikes between April 1 and July 20, with as many as 1,000 labourers assembled for mass meetings.[54] Conflicts spread across immigrant communities along the First and Second Welland Canals, compounded by cultural and economic conditions that persisted through the 1870s.

THE SECOND WELLAND CANAL ERA, 1845

The limitations of the First Welland Canal locks were noted soon after its opening. While the efficiency of the First Welland Canal was controversial, its economic benefit to the region was clear, transforming both manufacturing and industry.[55] By 1838, the Second Welland Canal had been initiated by the Welland Canal Company, with reconstruction beginning in 1841. Canal improvements coincided with the British North America Act, uniting Upper and Lower Canada to form the Province of Canada in 1841. This led to the creation of the Board of Works that focused government initiatives on inland navigation improvements, positioning Niagara with a significant advantage within Canada West.[56]

While the canal route would be similar, the reduced number of enlarged stone-built locks doubled the capacity of shipping. Additionally, the excavation of a "capacious basin" in 1848, between locks 1 and 2, enabled a safe harbour for shipping at Port Dalhousie. And in 1855, gas lighting was installed between Lock 2 and Thorold that enabled 24-hr navigation, except for the Sabbath (Sundays) when operations were prohibited.[57]

St. Catharines rose to prominence in the provincial economy due to its manufacturing capacity—a position it would not have experienced if not for waterpower and navigation across the peninsula. Besides power and transport, canal water was used to produce paper and to wash raw materials such as cotton. Meanwhile, insurance rates for local industries were relatively low because of the availability of water for firefighting.[58] The increase in shipping, shipbuilding and repair, lock, dock and harbour maintenance, among other requirements, led to Niagara becoming the leading employer in the marine sector within Canada West by 1851.[59]

Port Dalhousie, 1880s. Courtesy Brock University Library Archives and Special Collections.

A combination of forces would expand shipping and industry along the canal. The repeal of the British Corn Laws in 1846 opened competition with U.S. wheat markets for export. Conversely, in 1854, the Reciprocity Treaty between the U.S. and Britain, allowing free trade, encouraged shipping of resource exports from Canada West, in exchange for granting the U.S. navigation rights to the St. Lawrence River. Forest products became the second-leading export from Niagara, while also supporting settlement and local shipping. Niagara would benefit not only from trade to the west, but also from the Lake Ontario and St. Lawrence trades, creating new businesses and communities within the region.

The deepening of the Lachine Canal through Montreal in 1849 opened an Atlantic gateway for the Great Lakes trade, that spurred additional opportunities for Niagara concerns.[60] For ship owners such as Thomas Merritt, this quickly led to partnerships at Montreal and within the Atlantic Provinces, for propellers and sailing craft.[61]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And all points on the upper Lakes, with
NEW YORK, ALBANY, TROY, BOSTON, OSWEGO, OGDENSBURGH,
KINGSTON, MONTREAL AND QUEBEC,
Also connecting with the AIR LINE at Welland Junction, and Allanburgh Division, of the S. W. R. R. at Merritton.
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Advertisement in the *St. Catharines Business and General Directory*, 1874.

By the late-1850s, this had evolved into direct trade with Europe, providing a profitable new venture and by-passing the costs of transshipment at either Montreal or Quebec City. Dozens of Niagara-built sailing ships carried cargoes of timber across the Atlantic, some returning within the same season with cargoes of coal, food items and manufactured goods. Others participated in the Atlantic trades for a period, before returning to the Lakes. A market existed for the sale of Great Lakes-built ships, on which some shipbuilders capitalized. The 400-ton *Pride of Canada* was manufactured and owned at St. Catharines in 1859 and sold at Liverpool the following year for employment in the palm oil trade to West Africa.[62]

The 1850s marked the commercial advance of rail services in Niagara. This was intended to complement the Welland Canal, supporting additional shipping capacity to be carried once ships had transited the canal, at either the Port Dalhousie or Port Colborne terminus.[63] The Great Western Railway (1853), the Buffalo and Lake Huron Railway (1858), and the Welland Railway (1859), created additional employment for stevedores on the Second Welland Canal, while advancing the profits of local shipping companies. This led to new opportunities and connected business interests across the Province of Canada. It promoted cross-border trade, which increased exponentially between 1854 and 1866, but the increasing use of these railways would lead to challenges for Niagara's marine industry by the 1880s.

The Crimean War had both positive and negative consequences on marine transportation. It increased demand and drove up the prices for North American wheat, due to the British ban on Russian supplies. That provided a lucrative opportunity to local industry. European supply lines resumed quickly at the end of the war in 1857, which then led to disastrous results.[64] Several local millers and ship owners, who were unable to dispose of their immense stores of wheat, were forced to sell their business and vessel shares. The recession would have a further cascading effect. James Norris and Sylvester Neelon purchased two of the mills involved in the failure, increasing their shipping business and their fleets as a result. Meanwhile, Louis Shickluna was forced to briefly sell his business, after one of these millers was unable to repay his debt to the shipbuilder.[65]

The opening of the U.S. Soo Locks in 1855 would complete the navigation of the Great Lakes system, providing a valuable route that enabled increased export of iron ore and wheat through the Welland Canal and across the Atlantic. Some 170 years later, iron ore remains the largest export through the Welland Canal.[66]

The opening of the Canadian Soo Lock in 1889 provided further demand for wheat markets from Fort William (later Port Arthur) and facilitated rail shipments for construction of the Canadian Pacific, the latter which would have significant impacts on shipping and later manufacture at Niagara.

Initially, sailing vessels were towed through the canal by teams of either horses or oxen. A line would be attached from the teams' towing harness to a tow post fitted on the vessels' deck, and the "horse boy"—usually a boy between 13 and 18 years of age—would urge the teams on along the tow path and through the locks.[67] This led to the establishment of liveries at Port Dalhousie and Port Colborne, to provide for these teams including provisions and supplies. By the period of the Second Welland Canal, the larger canal vessels were fitted with horse boxes, providing their own teams of horses to pull them through the waterway. In 1861, the government issued the first call for tenders permitting "tow steamers" on the canal, that led to new investment and shipping opportunities.[68] Although tugs would largely replace horses on the Welland Canals, the construction of a tow path on the Third Welland Canal ensured that routes for "horse" power were still available. As late as 1902, the four-masted schooner-barge *Minnedosa*, was towed on the third canal route, requiring four teams of horses to move the ship. Due to the vessel's length, the lock dimensions would not permit both ship and tug to share a lock.[69]

The impact of tolls and tensions stemming from the U.S. Civil War created the perfect storm by 1866. Growing opposition from U.S. commercial interests, resentment over the British decision not to refund tolls which American vessels were forced to pay on Canadian canals, and tensions resulting from the Civil War led U.S. Congress to abrogate the Reciprocity Treaty, an action that many feel contributed greatly to the realization of Canadian Confederation in 1867.[70] Canadian national ambition would have both positive and negative consequences on maritime transportation in the Niagara region.

An increase in U.S. tariffs from 15 per cent in 1859 to 45 per cent in 1870 posed serious challenges to Canada's industrial and economic well-being, forcing vessels to be laid up in the 1870s for lack of freight, while contributing to a decline in ship repair or rebuild work on U.S.-owned vessels.[71] Furthermore, a substantial reduction of tolls on the Erie Canal in 1875 contributed to a decline in U.S. shipping through the Second Welland Canal, that would persist until the opening of the larger, Third Welland Canal in 1881. Conversely, this led to increased investment in the canal trade by Canadian ship owners—particularly those at St. Catharines, Port Dalhousie and Port Colborne—where canal shipments increased from 10 per cent to 20 per cent between 1854 and 1875.[72]

The outcome was a commercial pattern that was the natural product of geography and circumstance. At Confederation, freight through the Second Welland Canal was 933,260 tons. By 1871, this increased to 1.48 million tons. But by 1880, before the opening of the third canal, freights had decreased to 896,122 tons.[73] Economic uncertainty in the immediate post-Confederation era promoted a renewed desire in Canada for reciprocity with the United States. Even after the National Policy was enacted in 1879, the Conservatives under Sir John A. Macdonald favored an arrangement that approximated a limited free trade agreement where each country removed the duties on a considerable list of natural products.[74] Economic fluctuations and tariffs would continue to impact the marine industry along the canal through end of the 19th century.

Communities and Labour

The opening of the Second Welland Canal encouraged manufacturing and service-related industries that led to an increased demand for labour. Many of the canal workers remained locally, providing services to shipping and engaging in new manufacturing opportunities spurred by hydraulic power.[75] The canal generated a competitive route for the export of forest and agriculture, with clear benefits to both Canadian and American businesses. The growth of trade supported development of these port towns and shipping infrastructure along the route, which pressed the need for additional skilled tradesmen and labourers, thereby encouraging further immigration and settlement.

The ethnic makeup of the maritime workforce was primarily English, Scottish and Irish. Germany, Italy, France and Malta would account for less than five per cent of the pre-1860 workforce, while U.S. immigration accounted for about 10 per cent though that decreased after 1865. The maritime industry was predominantly male, with only a few examples where women are documented having entered the industry, toward the end of the 19th century.[76] The 1891 Census identifies Emma Brownlee (age 27) listed as both a steamboat engineer and dressmaker, unmarried, at St. Catharines. The 1901 Census states Cloe Ramey (age 29) was employed as a ship carpenter at Welland, also unmarried, and Sarah Sutton (age 43) was employed as a sailmaker, along with her husband and son, in St. Catharines.

The canal communities at St. Catharines, Welland, and Thorold expanded rapidly, coinciding with the expansion of mills and industries powered by the Welland Canal. Dunnville and Chippawa each maintained significant populations which continued to benefit from their location on the Feeder Canal and Welland River through the 1860s,[77] while other communities including Port Robinson,

Allanburg and Humberstone would be centred on smaller, private enterprises. Interestingly, Port Dalhousie and Port Colborne, despite their role at the lake Ontario and Erie termini, remained comparatively small communities through the 19th century.

The Board of Works supported numerous government positions to facilitate operations along the route of the canal, including lock keepers, bridge operators, lighthouse keepers, and customs agents. Opportunities proliferated as new infrastructure was built, while increased shipping and the capability for 24-hour operations by the mid-1850s, required additional labourers. Canal repairs and maintenance were facilitated by government contractors, ensuring the waterway remained open for navigation. Principal contractors included Scottish-born stonemason John L. Brown, who had settled at Thorold in 1843, and supported harbour dredging, lock and lighthouse construction, including other building work during construction of the Second and Third Welland Canal.[78] The Gull Island Lighthouse was constructed under the supervision of Brown between 1846 and 1848, to guide ships into the Welland Canal at Port Maitland. The light remained crucial to navigation through the early 1930s and was decommissioned in 1969.

Gull Island Lighthouse, Port Maitland. Courtesy Maritime History of the Great Lakes.

Factories, mills, quayside services, towing businesses, shipbuilding, and repair, contributed to transforming the region from an agricultural to an industrialised landscape. The opportunities presented by the canal induced some immigrants to change occupation and position themselves to benefit from the marine trade. Alonso Quackenbush, who had emigrated from the United States, is listed as a farmer at Bertie (Welland) in the 1850s. He would become a tugboat owner at Port Dalhousie by 1860, which placed him and his sons Conrad and John, as key operators when towing was permitted on the canal in 1861.[79] Private enterprise had reverberating impacts on canal communities, while contributing to an expanding middle class that would shape social, political and economic developments across the region.

Provisioning vessels was another key business along the canal. Several chandleries stocked marine supplies, such as ship stoves, paint, charts, and navigational equipment, as well as the grocery provisions for the crews transiting the canal. Account records for St. Catharines-owned vessels in the 1850s, indicate Richard Chester and Charles Jamieson at St. Catharines stocked specialty items. W.N. Garden at Thorold, opposite Lock 25, also actively promoted his business to shipping, noting on his letterhead, "sea stores of every description always on hand."[80]

Work opportunities for skilled trades increased along the canal with advertisements for ship carpenters being a regular inclusion in Niagara-area newspapers as early 1831.[81] The rates of pay, however, remained unchanged, while manufacturing expanded throughout the 1840s and 1850s.

Introduction of Labour Unions

Shipyard workers had unionized since the 1850s with limited success. Strikes by ship carpenters at Buffalo and Oswego, NY in 1860, and Detroit in 1861, spurred formation of a union in Niagara. The Welland Canal Ship Carpenters and Caulkers Union was formed in early 1861, consisting of yard workers at St. Catharines, Port Dalhousie and Port Robinson demanding $1.75 per day, instead of $1.50, and weekly payments of their earnings.[82] Those belonging to unions were discharged, the yards closed briefly, while a settlement was convened.[83] By 1874, the St. Catharines branch of the Amalgamated Society of Carpenters and Joiners supported those engaged in local manufacturing, however, employment fluctuations led to its closing in 1881, reopening in 1906, and closing for a final time in 1924.

Employment for mariners within the canal communities was even more challenging. The conditions aboard ships, combined with the poor rates of pay, led to the formation of the St. Catharines Sailors Union in 1879.[84] The union attempted to fix wages, which was often not consistent with freight rates, leading to confrontation. In 1879, this was fixed twice during the season, at $1.50 per day for Lake Ontario and $1.75 through the Welland Canal.[85]

With fluctuating freight rates, the response from ship owners was that the carrying trade could be handled by the tugs, if necessary, at no significant increase in cost over what would be paid if a full crew were engaged to manage the sails. Niagara ship owners were the first to initiate the long tows across the lakes and through the canal, with up to seven schooner-barges towed by one steam barge or tug, reducing the number of sailors required. By the 1890s, the decline of sailing craft forced crews to retrain, or find alternative employment. Those employed on steamships would induce new unions and further strikes on the canal after 1900.

The 'Big Four'

Despite these challenges, the rise from seaman to businessman and politician was a frequent occurrence in Niagara. The familiar expression "fortune favours the bold" applies to dozens of enterprising men in the region. A fitting example was St. Catharines "Big Four" who were the largest Niagara shipping operators during the latter half of the 19th century. James Norris, Sylvester Neelon, Patrick Larkin, and James Murray began their careers as able seamen at Port Dalhousie in the 1840s, later becoming ship captains. In combination and independently, they started shipping firms, with Norris and Neelon engaged in milling operations at St. Catharines, and Larkin and Murray becoming shareholders with several shipping companies.

Larkin and Murray went on to become successful contractors, notably on construction of the Third Welland Canal. They would all become St. Catharines city councillors, with Norris becoming mayor in 1874 and Murray in 1882. Norris and Neelon also served as members of Provincial Parliament for Lincoln, in 1874–1878 and 1879–1886, respectively. Their combined efforts contributed much to the welfare and support of seamen and the community in later years. Norris led the campaign in 1856 to establish the St. Catharines General and Marine Hospital, which opened in 1865.[86] Norris and Neelon led the petition to establish the St. Catharines Board of Trade in 1872.[87] And Murray led the Shipowners Association in the 1870s. His efforts had significant impacts for navigation through the canals.[88]

Canal Manufacturing and Repair Before 1900

At the heart of industrialization along the canals was shipbuilding. Shipyards sprang up along the route of the canal to design ships that would support the growing canal trade. Even before the opening of the First Welland Canal in 1829, shipbuilders were faced with developing a vessel type that could maximize carriage though the waterway while remaining efficient and seaworthy. These considerations commanded the invention of the first commercial Great Lakes vessel type: Welland Canal ships (hereafter referred to as Welland canallers). These moderate and extreme canallers were designed to maximize cargo carriage through the evolving first, second, and third canal lock dimensions and constituted an industry that would characterize bulk trade and commerce on the Great Lakes for over 100 years. Even today, vessels built at domestic and foreign yards which intend to compete for passenger and bulk freight on the lakes, continue to be designed to Fourth Welland Canal dimensions, which remains the bottleneck for shipping on the Great Lakes.[89]

Steamships continued to be employed through the period, however the paddlewheel boxes were a limitation to navigation through the Welland and St. Lawrence canals. Adaptations included the pollywog, which hosted inset paddles to not interfere with capacity and were seen on the canal from the late-1830s. The Niagara Harbour and Dock Company built the first pollywog in the region in 1841.[90] It was the introduction of propeller-driven watercraft, however, that would revolutionize shipping on the Great Lakes and become a key product of Niagara-area shipyards after 1843.[91]

Ship launches at Niagara, during the first and second canals, were often grand affairs. They could attract hundreds of people both locally and from afar. The first such event at St. Catharines, in 1828, witnessed a greater attendance than at the opening of the Welland Canal, 18 months later.[92] Launches symbolized the combined efforts of communities, from labourer to investor, provoked pride in the quality of local workmanship, and represented intrinsic and extrinsic benefit to the local economy. The *St. Catharines Constitutional* identified the importance and impact of these events by 1856:

> *It would afford us as much pleasure to chronicle a similar event every Saturday, for we know of no recreation combining mere utility, and lasting benefit to the colony than "ships and commerce.*[93]

Most shipbuilders who operated along the canal produced watercraft between 100 and 500 tons, that would serve the bulk shipping or passenger trades. Sailing craft, steam and propeller-driven craft, tugboats, and other watercraft to support harbour or canal operations, were constructed across the region. Location was a key factor in the success of the more prodigious shipyards, while infrastructure was also a determining factor for surviving through periods of economic growth and decline. As manufacturing increased during the period of the Second Welland Canal, the canal builders were in great demand both locally, and across the lakes.

Connections within the canal communities, bridging shipping interests and shipbuilders, led to both profits and losses. The Beatty Line, which was first established in 1865 at Thorold, contracted Melancthon Simpson to build two steamships at Port Robinson.[94] One of these ships, the *Waubuno*, would founder after a 14-year career on Georgian Bay with the loss of 24 lives. Simpson would later construct the *Asia* at St. Catharines, under contract by a conglomerate of shipping interests that included St. Catharines businessmen Sylvester Neelon, John Graham and Thomas Merritt. The ship would serve on the Upper Lakes for nine years before foundering on Georgian Bay, with the loss of 123 lives. Samuel Cunard, through his interests in the Welland Railway Company, would contract Louis Shickluna to build two steamships, the *Perseverance* and the *Enterprise*, to carry grain and passengers between St. Catharines and Oswego, NY.[95] Unfortunately, the *Perseverance* would founder on Lake Ontario within four years owing to a fire aboard, and with the loss of 14 lives.

The *Asia* was built in 1873 at the Simpson Shipyard, located adjacent to Lock 5. Courtesy Dossin Great Lakes Museum.

Niagara shipbuilders continued in wooden shipbuilding through the 20th century, with only a couple examples where steel was introduced. The availability of forest materials, the costs of retooling shipyards and the re-education of shipbuilders, limited steel construction through this period. This would hinder manufacture across the Niagara Peninsula after 1881. Shipbuilding communities went into decline and, by 1900, many of the wooden shipyard facilities and supporting industries were obsolete. Port Dalhousie remained primarily a repair yard, with Port Robinson and Welland supporting tug and dredging operations.

Manufacturing Establishments

The period of the first and second Welland canals led to rapid advancement in the requirements for marine transportation. To meet demands for larger vessels that could not pass through the canal, shipbuilders frequently had to move location. Additionally, several builders leased premises along the canal, and their operations moved according to various internal and external forces. This led to a diversified and changing workforce at different locations. As such, the following is organized primarily by operators, rather than by location before 1900, while detailing the shifts that led to the closure of these shipyards. While there were additional shipbuilders that built the occasional vessel, the following focuses on the larger and more productive establishments.

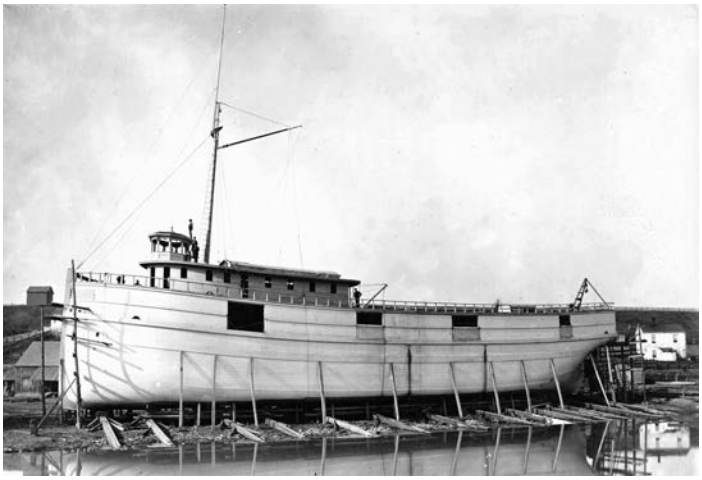
Russell Armington

St. Catharines remained a central location for shipbuilding during the first and second Welland canals. Beginning in January 1827, meetings for "immediately building a suitable boat for navigating the waters of the Welland Canal" were held in St. Catharines.[96] The first canal shipyard was established at St. Catharines, on the south bank of Twelve Mile Creek, by Russell Armington who launched the schooner *Welland Canal* in 1828. Armington would build five further vessels from his "dockyard" and, in 1831, submitted a proposal to the Welland Canal Company "for a Dry Dock to provide support for the increasing canal trade."[97] The company invited tenders for its construction soon after, and the facility opened in 1832.[98] The dry dock would have expanded Russell Armington's business by providing a crucial repair facility to the ships navigating the First Welland Canal.[99]

Louis Shickluna

With Armington's passing, Louis Shickluna leased the shipyard property in 1838. The shipyard became the largest shipbuilding manufacturer in the Niagara region by the 1850s, and a leading employer in St. Catharines through the 1870s.[100] Shickluna is credited with launching over 100 vessels at the shipyard, built for the canal or Lake Ontario trade. He would expand capacity in 1846, having secured the lease for a new dry dock beside Lock 3 and, by the mid-1850s, increasing its size to a double dry dock that enabled two canal-sized ships to undergo repairs simultaneously.[101] The facility serviced hundreds of lake vessels built for the bulk, passenger, and packet trades, as well as other watercraft that supported regional economic development. The dry dock remained in operation for over 50 years.

With Louis' passing in April 1880, his sons Joseph, Henry and George, would continue in shipbuilding and repair, launching six ships between 1881 and 1885. The brothers would launch the only composite-built ship, meaning iron-framed and wood-planked, in the region, the *S.L. Tilley* in 1884.[102] The route of the Third Welland Canal impacted the location, demand, and requirements for the shipyard. The limitations of the dry dock, briefly taken over by Patrick and Harry Dixon, led to its closure in the mid-1890s.



The *S.L. Tilley* was the region's only composite-built ship (iron-framed and wood-planked). It launched in 1884. Courtesy Brock University Library Archives and Special Collections.

Robert Abbey

Robert Abbey established the first shipyard at Port Dalhousie by 1840, with a small boatbuilding facility on Lake Ontario. As demand increased, he built several canallers in the early 1840s. His sons John and James Abbey, who apprenticed at the Shickluna Shipyard, established a shipyard at Port Robinson in 1853, and built a dry dock by 1855, the facility remaining in operation through 1909. Meanwhile, another son, Alexander Abbey, built at various locations including Port Dalhousie, Port Robinson and Port Colborne between the 1850s and 1890s. Alexander Abbey's sons John, David and Robert Abbey would continue at these locations between the 1870s and the 1890s.

Alexander Muir

Alexander Muir established a shipyard in the early 1850s at Port Dalhousie below Lock 1 on the second canal, later partnering with his brothers in shipbuilding and repair work. Muir would construct a floating dry dock in the mid-1850s, replacing this with a traditional dry dock in 1860.[103] With the routing of the third canal, the Muir facility remained ideally positioned, adjacent to the new Lock 1, and enjoyed increased business after competing shipyards and dry docks on the second canal route were forced to close. The Muir family continued to service the second and later third canallers, before the company was purchased in the 1920s. The dry dock continued to be used until the mid-1960s, when the Port Weller Dry Docks shuttered the facility.

Muir shipyard, Port Dalhousie, 1880s. Courtesy Brock University Library Archives and Special Collections.

Donaldson, Andrews, and Ross

The partnership of William Donaldson and Stebbins Andrews was established first at St. Catharines, having briefly taken ownership of the Shickluna Shipyard. Shickluna repossessed the property, and Donaldson, Andrews, and William Ross established a new facility on the east side of Martindale Pond, below Lock 1 in 1859.[104] Constructing a dry dock in 1861, the firm remained at this location until 1870. The route of the Third Welland Canal, which was to run through the property, forced Stebbins and his son to relocate to Port Robinson, where they took on additional shipbuilding contracts in Welland and Port Colborne.

The *Maggie R Mitchell*, built by Ross and Son, towing at Port Colborne circa 1890. Courtesy Toronto Marine Historical Society.

William Donaldson would return to his previous occupation as a ship captain, and William Ross and Sons would establish a new facility at Welland, with contracts at additional locations from Port Robinson to Port Colborne before 1902.

Melancthon Simpson

Melancthon Simpson served at the Muir shipyard before establishing a shipyard at Lock 5 in 1864, producing at least 15 vessels over the next 10 years. His business at St. Catharines focused primarily on the construction of steam and propeller-driven craft, rather than repair, with occasional shipbuilding contracts at Port Robinson. Given the competition with established dry docks in the region, and the planned expansion of the canal, Simpson closed his facilities in 1874.

Matthew Beatty

Matthew Beatty established a shipyard at Welland in the 1860s, producing tugs and steam dredges.[105] Beatty would become one of Welland's largest employers by the late 1880s, employing 60-100 skilled mechanics. His interests extended to tugs and towing services on the canal. The business was incorporated in 1901, and by 1905 Beatty relocated the facilities to the east side of the Welland Canal, to enable shipping by both rail and canal, modifying several older piers into dry docks. Diversifying his product range and inventory, he was joined by sons William, Harvey and Alvin, forming Beatty & Sons in 1907. The operation continued until 1917, when the North Main facility was leased by the British American Shipbuilding Company, under wartime contracts.[106]

Port Colborne Boat and Shipbuilders

Several boat and shipbuilders operated periodically at Port Colborne, on the east side of the canal. The premises were located on small lots by the water, fitted with workshops, where they produced rowboats, yawl sailboats, yachts, schooners, steamships, tugs and fishing boats. Among these were Joseph and Salvator Shickluna (1861–1900), George Chase and his sons George Chase Jr., and James (1866–1893), and George Hardison (1868–1872). Due to competition from the canal builders above Welland, most of these shipbuilders diversified their skill, building houses and engaging in other manufacture, to stay afloat.

Fort Erie Shipbuilding

Shipbuilders at Fort Erie manufactured a few schooners and other watercraft in the 19th and early-20th century. Shipbuilding was undertaken infrequently, most likely due to significant competition by shipyards across the river in Buffalo. The most notable build before the 20th century was by railway interests. The Grand Trunk Railway commissioned the first and only prefabricated iron ship at Niagara, the train-car ferry *International*. Built at Glasgow and overseen by Henry Beatty, it was shipped for reassembly at Fort Erie, where it was completed in 1872.[107]

Supporting Industries

The merchant communities around the shipyards would be positioned to manufacture specialized equipment for shipping. James McCourt at St. Catharines, David Robeson at Port Dalhousie, and Richard Blamey at Port Colborne were among those that produced many of the sails for the ships that were launched. It took thousands of square yards of sail to fit out a sailing vessel, especially barkentines with their extended square sails. With new builds and regular maintenance, sail making would have been a much-needed business in the region. Conversely, by the 1850s—with the increasing numbers of steamers and propellers—manufacturers of specialized boilers, steam engines and other interior machinery were required. George Oille operated a thriving machine shop and foundry near Lock 4 and supplied engines for many of the vessels built along the canal.

Among the other industries was block manufacturing. Pulley blocks were used for running ropes and hoisting up sails, with hundreds required to operate sailing vessels. Louis Shickluna operated a block manufactory adjacent to his dry dock at Lock 3 in St. Catharines. Thomas Rudman operated a block manufactory at Port Dalhousie, while Archibald McIntyre owned a block facility in Thorold by 1871. Remarkably, although rope manufacture was a crucial business to the marine community—a single sailing vessel requiring miles of rope for rigging and anchor cables, among other applications—no rope walks were established in the Niagara region, during this period. Rope walks were long, narrow buildings fitted with machinery to twist hemp and manilla into rope, cordage and twine. Hamilton, Toronto, and Kingston each had two or more ropewalks and it is likely that a supply chain with Niagara supported local requirements.

THE THIRD WELLAND CANAL ERA, 1882

The enlargement of both the Welland and St. Lawrence canals was actively promoted after Confederation, with the new Dominion raising tariffs to shelter Canadian industries, and support canal construction.[108] This coincided with an economic depression that began in 1873, with the collapse of the New Orleans commodities market. Combined with American tariffs, this brought about a decrease in the flow of exports through the canal, from Canadian to U.S. ports.

Despite these economic challenges, construction of the third canal progressed through the 1870s. The waterway would run diagonally across St. Catharines, from Martindale Pond to Thorold, providing a more direct and shorter route for ships to navigate from Port Dalhousie to Port Colborne, and benefitting from larger, deeper locks. When the canal officially opened in April 1882, it brought significant changes for the region. The relocation of the waterway led to the decline of water-powered industries and the closure of several of the shipyards that operated on the first and second canal routes. Conversely, the canal led to new opportunities for manufacturing and hydroelectric development. Technological advances in marine manufacture and the growth of Great Lakes shipping would shape the region's marine industry after 1900.

As commercial requirements increased, government initiatives led to several key improvements. The deepening of the Third Welland Canal by 1887 had coincided with the 1885 enlargement of the Lachine Canal in Montreal. This encouraged navigation improvements across Great Lakes ports and harbours and, especially in Niagara, to support increased tonnage. At Port Dalhousie, this led to the construction of concrete piers in 1895.[109]

Similar improvements were made at Port Colborne with the deepening of the channel, construction of two docks and piers for the erection of new grain elevators, and the construction of the breakwater in 1901.[110] Electric lights were installed along the Third Welland Canal by October 1905.[111] New lighthouses were constructed, which underwent several technological transformations before automation at Port Dalhousie (1968), Port Weller (1969) and Port Colborne (1979). The new hydrographic service department would initiate surveys to support canal developments between 1895 and 1897, and additional resurveys during the years leading up to the First World War.[112]

Environmental Impacts

The Welland Canals have served as a vector for the introduction of invasive species to the Great Lakes through ballast-water or upbound transit through the locks.[113] Species such as the sea lamprey were introduced to the upper Great Lakes through the third canal.

The significant ecological impacts of canal construction, and its legacy, would lead to pollution, erosion, and a decline in fish populations by the 20th century. Waste disposal originating from Lake Erie or from industrial, commercial, and residential development around the canal led to further environmental impacts.[114]

Another source of water pollution was dredging, contributing to a loss or degradation of riparian habitats and biodiversity, while altering hydrodynamics. While the historic canals played a damaging role in contamination, and the introduction of some invasive species, the Fourth Welland Canal, in conjunction with the opening of the St. Lawrence Seaway in 1959, would further exacerbate these negative impacts.

Tolls, Tariffs, and Trade

Trade agreements, tariffs, and tolls continued to shape and impact marine transportation. A U.S. government order in 1881 instructed customs authorities to prohibit Canadian vessels to carry lumber to American ports in bond.[115] The McKinley tariff in 1890 closed much of the American market to Canadian interests. These limitations, combined with American reluctance to negotiate free trade seriously, hindered the reciprocity movement in Canada. The Canadian government retaliated by applying tolls on U.S. registered ships transiting the Welland Canal. These changes would impact the canals by 1891, with freights amounting to 959,502 tons, and by 1901, plummeting to 620,000 tons.[116]

In 1905, tolls were stopped, but were reintroduced by the 1950s. Despite protectionism and higher tariffs, the demand for Canadian resources ensured that shipping through the canal remained profitable. Manufacture and shipping on the canals would see a marked increase over the following 20 years. In 1928, shortly before the opening of the fourth canal, freight shipments had multiplied considerably, accounting for 7.4 million tons.[117]

Communities and Labour

The concurrent operations of the second and third Welland canals, between 1881 and 1915, required duplicate staff and additional infrastructure expenses. Harbourmasters, bridge and lock masters, storekeepers, ferry operators, machinists, and divers are among those on the paylists to support operations.[118] Upbound sailing vessels, often without cargo, were routed through the Second Welland Canal route from ports on Lake Ontario. And when downbound from the Upper Lakes, laden with cargo, they would ship primarily through the Third Welland Canal. By 1915, navigation had ceased on the second canal, due to the strong current created by hydroelectric developments.[119]

The third canal would affect the prominence of communities situated on the feeder canal. The new route no longer depended on the feeder for its source of water and instead water was directly supplied from Lake Erie

through the canal. The population at Chippawa declined quickly after 1890, due to the relocation of industry and impacts to navigation along the Welland River. While Dunnville and other feeder communities, no longer within the boundaries of Lincoln, had identified new paths to expansion including textile industries, while remaining a centre for mixed farming.

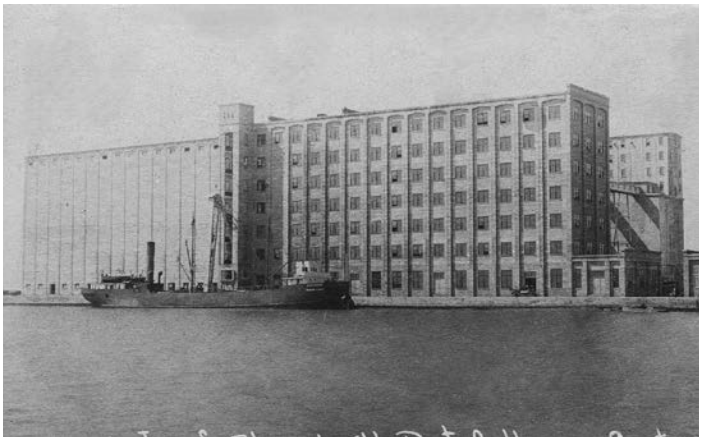
The requirements of the second and third canal, in addition to new industry and hydroelectric developments, drove population increases at St. Catharines and Welland.[120] Expansion and investment at St. Catharines led to a population increase of 30 per cent in 20 years, its capital investment in turn increased over 200 per cent. It was, however, Welland that transitioned astonishingly during this period. Doubling its population and tripling employment, its capital investment increased by 1000% between 1891 and 1911. The creation of the Welland Board of Trade in 1889 heavily promoted new industry, embracing the motto "Where Rails and Water Meet," which was crucial to the town's success. Thorold remained steady through the period of the third canal, while Port Dalhousie and Port Colborne would see a slight increase, due to tourism and new industries.

Supporting Industries

Third canal communities on the main waterway benefitted from increased commercial shipping after 1900. Several machinists and marine blacksmiths were established at Port Colborne and St. Catharines, including Thurston, F. Woods & Sons, and R.J. Black and Company. Meanwhile, Frank Scott & Son and the Latcham Brothers, both at Port Dalhousie, advertised their services in grocery provisioning and provided 24-hour service.[121]

Laundry services were also promoted to the marine industry, with Wash-Rite Laundry established at St. Catharines in the 1930s. New facilities were installed along the Welland Canal that provided storage for coal which fueled the majority of pre-1930-built ships on the Great Lakes.[122] The Lannon Coal Company and Valley Camp Coal provided fueling docks at Port Colborne, Century Coal managed a fuelling dock at Humberstone, Weaver Coal and Ontario Paper each had coaling docks based at Thorold, and the Hutchinson Estate had a fueling dock located at Port Dalhousie. New grain elevators were erected to support storage at Port Colborne, including Maple Leaf Milling, and the Government Elevators.

The continued requirement for tugs on the Third Welland Canal led to several new operators. The Carter Brothers at Port Colborne incorporated the Welland Canal Tug Co. in 1903.[123] Other operators soon followed, leading to dangerous races to secure a tow at Port Dalhousie and Port Colborne. Competition resulted in the loss of the *Escort* in 1907, which had been built by William Ross at Port Colborne in 1894. With the Fourth Welland Canal, tug services declined, as pilot services were not required for transit, and the Seaway Authority provided towing for vessels in distress.[124]

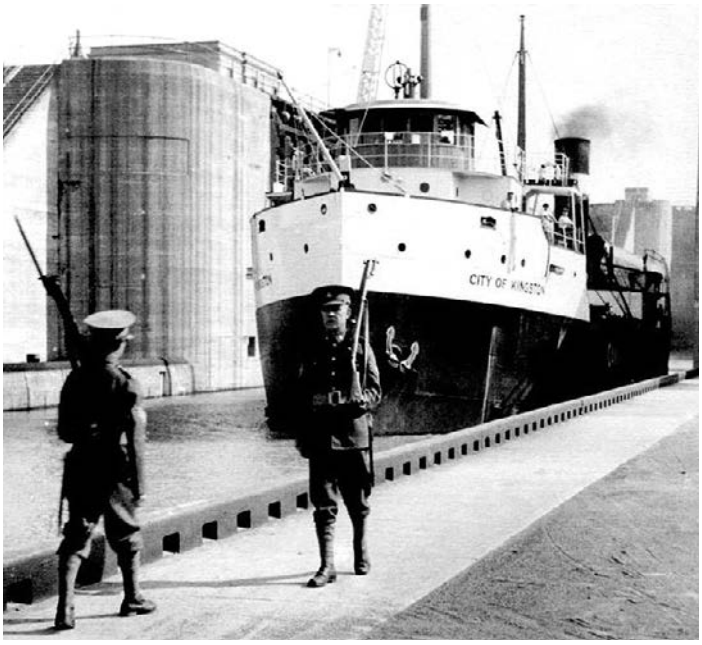


Maple Leaf Flour Mill, Port Colborne, 1911. Courtesy Brock University Library Archives & Special Collections.

Labour conflicts and terrorist threats on the Welland Canal led to the allocation of a police force to maintain peace and to guard the canal against attacks. The force, charged with guarding and protecting government property on or near the canal, would be increased or decreased depending on the severity of threats, on the first and second canal.[125]

With the Third Welland Canal, German threats at the start of the First World War led to expanding what became known as the Welland Canal Force, to protect the canal, its locks, weirs and bridges, emergency shipyards, and factories that manufactured munitions. Patrols were also installed at the bridges over the Niagara River, and its hydroelectric stations. The men of the 19th St. Catharines Regiment and the 44th Lincoln and Welland Regiment served as the basis for the formation of the force which consisted of up to 1,250 soldiers.[126] The Second World War would trigger further military patrols on the fourth canal, to ensure shipping and wartime production progressed without incident, often employing First World War veterans to guard the route.

Canal developments would shape several new investments in shipping, while supporting both skilled and unskilled labour opportunities. The Port Colborne and St. Lawrence Navigation Company was formed in 1913 as the lake shipping subsidiary of the Maple Leaf Milling Company and remained in operation until its last ship, the third canaller *Benmaple*, foundered on the St. Lawrence in 1936.[127]



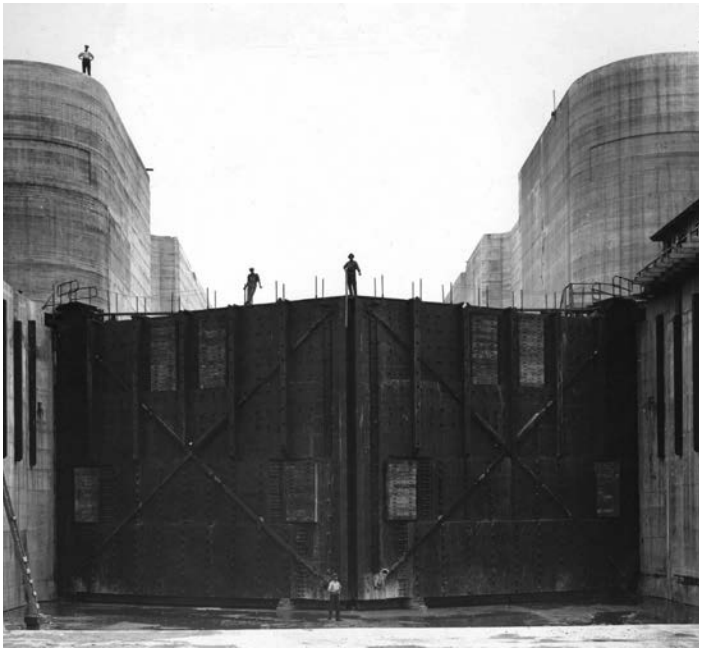
Guarding the flight locks at Thorold, 1939. Courtesy *St. Catharines Standard*.

The Ontario Transportation & Pulp Company was established in 1914 at Thorold, to supply the Chicago Tribune with a reliable supply of newsprint at prices not subject to market fluctuations. The mill site on the Welland Canal provided the added benefit of inexpensive hydroelectric power from Niagara Falls. The name was changed in 1923 to the Chicago Tribune Transportation Company and finally in 1928 to the Quebec and Ontario Transportation Company. The Q & O ceased operations in 1983, and the property transferred ownership several times before 2017. The property has since been acquired by BMI Group, for conversion to a new port facility to be operated by the Hamilton and Oshawa Port Authority.[128]

The Chicago Tribune sourced its newsprint from Thorold, with a mill site on the canal, 1930. Courtesy Alpena Library Special Collections.

THE FOURTH WELLAND CANAL ERA, 1932

The limitations of the Third Welland Canal would be broached with the government beginning in 1900, with petitions from those in the U.S. and Canadian marine industry. Construction of the Fourth Welland Canal began in 1913 but had been placed on hold during the First World War. The war further demonstrated the constraints of the current waterway. Several ships from U.S. and Canadian emergency shipyards, including the *War Otter* and the *Canadian Squatter*, had to be constructed in two parts, to facilitate towing through the Welland and St. Lawrence canals, and then assembled at Montreal.[129] The canal's construction resumed quickly in 1919 and continued until 1931.



Lock 1 on the Fourth Welland Canal, 1927. Courtesy Brock University Library Archives and Special Collections.

The Welland Ship Canal officially opened in August 1932 and continues to be used today. It would lay the foundation for the region's modern marine economy, transforming the Great Lakes by increasing its competitiveness in global shipping and manufacture. It was also the first decisive step toward the construction of the St. Lawrence Seaway. Niagara would slowly regain its prominence within Ontario's marine economy, through its location on this crucial transportation corridor. By expanding its facilities to support steel manufacture, repair and shipbreaking—providing end-of-life recycling for the aging fleets—marine transportation would achieve new milestones, while also contributing to urban renewal.

The export grain trade remained a staple for ship owners, but it was no longer the single driving force behind investment in shipping.[130] The demand for iron ore and coal also contributed to the expansion of shipping and canal infrastructure, while also serving as a driving force behind manufacture. Marine transportation was now a mature multi-faceted sector whose significance was reflected in the Canadian government's concern for its continued prosperity. Competition from British and U.S. shipping would increase use of the canals, while pressing the urgency for a bi-national waterway to support maximum freight through the entire Great Lakes-St. Lawrence system.

The opening of the St. Lawrence Seaway in 1959, as anticipated, had a significant impact on the Welland Canal. The increase in canal depth to 8.2 m (27 ft) by 1959 enabled what has become known as "Seawaymax size". Traffic comparisons for the fourth canal over this time illustrate its increasing demand, highlighting the benefits from the St. Lawence Seaway.[131] In 1932, freight through the canal was 8.5 million tons. By 1940, this had increased to 12.9 million tons, and by 1950, 14.7 million tons. In 1960, just one year after the opening of the Seaway, freight through the Fourth Welland Canal rose to 29.25 million tons. And by 1969, over 53.57 million tons were shipped through the canal.[132]

Environmental Impacts

The Seaway would, however, result in significant impacts on the environment and ecosystem within the Great Lakes region. About two-thirds of the 185 nonindigenous species in the Great Lakes have arrived since 1959, travelling through the Fourth Welland Canal.[133] Increasing opportunities for global export led to the expansion of industry, rising discharges of contaminants from construction activities, while corrosion-resistant paint on vessels, and cargo sweeping activities, amplified pollution concerns during the 1960s. Ship engines producing turbulence and dispersion have further contributed to resuspension of sediments and contaminants in the water column. All these factors render the waterway susceptible to toxic contamination. Bi-national cooperation and government funded research have, in recent years, helped to mitigate impacts. Efforts including the 'swish and spit' method toward reducing the risk of invasive species carried in ballast-water, and the Great Lakes and St. Lawrence Cities Initiative focusing on preservation issues across the region, are helping to lessen further damage due to marine transportation.[134]

Communities and Labour

The founding of Port Weller, as the new Lake Ontario entry point to the canal, would result in St. Catharines and Port Colborne serving as the custom ports of entry after 1931. Increased tonnage transiting the canal had significant economic benefit to the region, which led to new dock facilities and services at Port Weller, Thorold, Welland, and Port Colborne, to support ships transiting the canal. The decline of canal-side manufacturing and the shortened canal route, led to more consolidated communities and centralized operations after 1960. Expansion after the Second World War triggered significant reorganization, amalgamating communities under a single umbrella.[135]

St. Catharines continued to expand before 1970 due to increased growth across sectors, while Port Dalhousie would nearly double in population because of marine developments and tourism. The population increase at the southern terminus was due in large part to shipping investments at Port Colborne. While at Thorold and Welland, industry and expanding multimodal transportation networks enabled these locations to thrive, increasing employment opportunities. While many communities were allowed to remain independent, canal towns such as Merritton would be forced to become part of St. Catharines in 1961.[136] Today, canal lands owned by Transport Canada and declared surplus to the operation of the Welland Canal, provide opportunities for brownfield development. This has triggered new commercial interest, providing warehousing and transportation solutions with direct access to the canal.[137]

Coinciding with fourth-canal construction, new services and manufacturing were established to benefit from proximity along the waterway. Port Colborne Iron Works provided various services beginning in the 1920s, including diving and marine salvage work. Company owner, Henry Edric Heighton, would receive a patent on "fairleads for cables and the like" in 1934.[138] The invention would spark new manufacturing at Port Colborne, particularly benefitting canal shipping, by enabling ships to lock through with greater ease. The company remained in business on Fraser Street until the 1990s, and in 2002, L A Group Steel Inc., took over the premises.

Increasing rail transportation after the opening of the Canadian Pacific in 1889, led to new directions for marine transportation. Several commercial steamship lines developed, connecting fleets with rail services and providing integrated transportation solutions. The Sarnia Steamship Company, which became the largest fleet on the Great Lakes, was established at Port Colborne in 1929.[139] The company would rebrand to Colonial Steamships Ltd., in 1951, Scott Misener Steamship Co. in 1959, and then to Misener Transportation Ltd., in 1978, to reflect the changing dynamics of the company and water transportation. In March 1994, the remaining ships of the Misener fleet were divided between Algoma Central Marine and the Upper Lakes Group Inc.

Labour Action

The lack of government regulation on shipping remained well into the 20th century, increasing risks for those engaged in the marine trades. As employment prospects diminished in sail and with sailors excluded from employment in steam due to licensing requirements, acceptance of work aboard schooner-barges brought with it loss of status and some of the lowest-paid marine labour on the lakes.[140] This pressed the formation of new unions to support marine transportation. The International Seamen's Union began in 1899, and later merged with the Seafarers International Union (of Canada) in 1938. Additionally, the Canadian Seamen's Union (CSU), which formed in 1936, became the first organization to have significant impact on marine transportation in the region.[141]

Crucially, a one-month strike in 1946 by the CSU brought considerable gains; included in the new agreement were an eight-hour day, union security, a 20-per-cent wage increase, $0.75 per hour overtime, seniority rights, and a 10-day paid holiday each season.[142] Labour was emerging into the 20th century; however, another strike two years later had a significantly different outcome. The 1948 strike on the Welland Canal has been described as "one of the most violent and controversial international labour battles in Canadian history."[143] Striking seamen came ashore and camped along the canal from Port Colborne to St. Catharines, to prevent shipowners from bringing in strike-breakers.[144] Niagara's unions decried the treatment of the seamen, raised funds and staffed picket lines all along the Welland Canal. The fate of the CSU was sealed when pressure from the American Federation of Labour led to its ouster from the Trades and Labor Congress of Canada, allowing the Seafarers International Union to fill the void. To this day, Seafarers International Union (of Canada) continues to represent thousands of qualified seafarers across Canada.

Seamen released from the Welland Jail are pictured on the dock at Thorold, next to the S.S. *Noronic*. Courtesy Toronto Star Photograph Archive.

Canal Manufacturing, Repair and Shipbreaking After 1900

The transformation of Niagara shipyards for steel manufacture began in 1907. An expanded workforce and retooling of facilities led to increased production of steel cargo ships and watercraft to support construction and operations along the third and fourth Welland Canal. The formation of the Dominion Marine Association in 1903, would directly support local shipping and trade, while encouraging improvements in vessel design and navigational safety.[145] The organization, which rebranded in 1988 as the Canadian Shipowners Association, continues to support these aims today. New supply chains to furnish equipment and technologies necessary to fit out cargo ships were established. Developments before 1950 would be brief but transformative, launching a new chapter in the history of shipbuilding on the Niagara Peninsula.

With the opening of the St. Lawrence Seaway, the market for ocean carriers expanded, and that prompted increased production at Port Weller. Meanwhile, an aging fleet would lead to requirements for shipbreaking at Port Dalhousie, and later Port Colborne. Manufacturing wasn't limited to commercial shipping, however. Niagara would become a leader in the production of boats and yachts, beginning in the 1930s. Boat and ship manufacturing continues to play a significant role across the region today, with several concerns actively involved at St. Catharines, Fort Erie, and Port Colborne.

Manufacturing Centres

Fort Erie

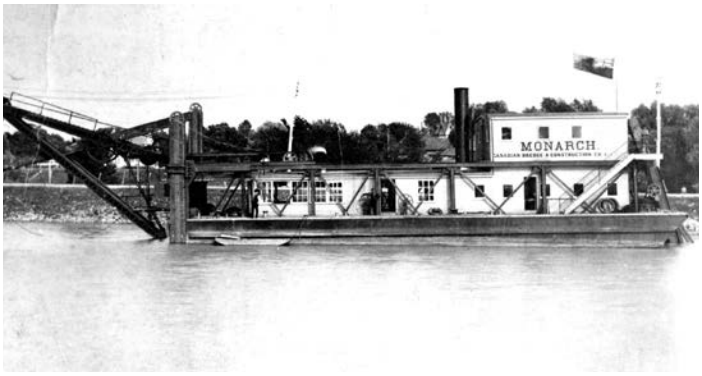
In 1907, Canadian Shipbuilding Co. Ltd., whose headquarters were based at Toronto, established an "Upper Lakes" shipyard at Bridgeburg, Fort Erie. Its first and only launch was the steel bulk freighter *E.B. Osler*, later that year. Shortly after completion, the company went into receivership, and no further contracts were let at Fort Erie.[146]

During the First World War, an emergency shipyard was established at Bridgeburg, by Canadian company Allis-Chalmers, which had secured wartime contracts to manufacture four steel cargo ships required for transporting supplies and munitions. The shipyard was located near Miller's Creek, where the facility was fitted with four berths. Between 1919 and 1920, the company launched the *War Vixen* (September 1919), *War Leveret/Magic* (January 1920), *War Wallaby/North American* (August 1920) and the *War Wombat/South American* (October 1920).[147] Horton Steel Works Ltd, which established at Bridgeburg in 1913, took over the facility

after the war. In 1935, it was contracted to manufacture the first two welded tankers in North America, the *Bruce Hudson* and the *Transitor*, built for the carriage of crude oil.[148]

Welland

At Welland, Canadian Dredge and Dock was formed in 1915 to support the digging and dredging of the Fourth Welland Canal.[149] Its facilities included a shipyard which maintained the company's large fleet of tugs and dredges. After completion of the fourth-canal contracts, the company removed its facility and assets to Kingston. Another emergency shipyard was established at Welland



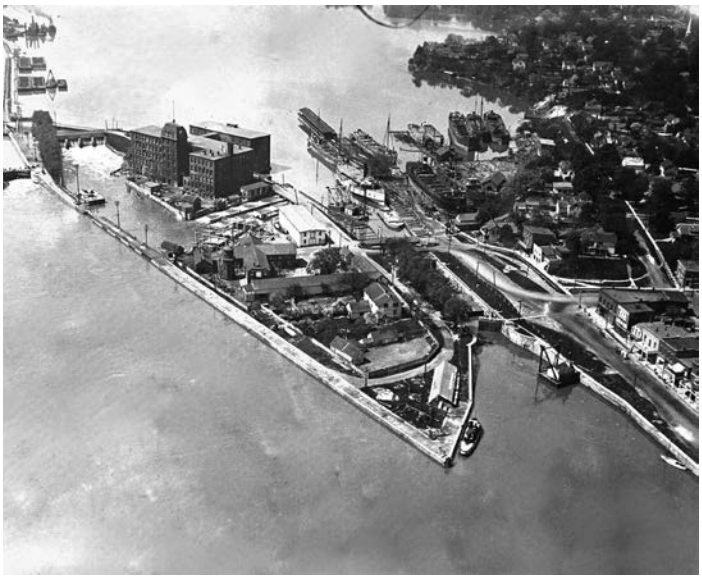
Canadian Dredge *Monarch*, 1920s. Courtesy Brock University Library Archives and Special Collections.

by the British American Shipbuilding Company which had secured government contracts to manufacture five steel cargo ships to aid the war effort. Its facility was located at the west end of West Main Street, which it fitted out with three berths to construct the *War Weasel* (May 1918), *War Badger* (August 1919), *War Raccoon* (October 1919), *Canadian Otter* (August 1920) and *Canadian Squatter* (November 1920).[150] The yard was short-lived and closed in 1920 after the five ships were completed.

Port Dalhousie

The Muir Brothers Dry Dock Company at Port Dalhousie remained competitive in repair and vessel conversions through the mid-20th century. Due to its location at the entrance to the third canal, and especially after closure of the Shickluna dry dock, demand often exceeded space. This led to repurposing third-canal locks that, when drained during the winter, could be used as docks for repairs. By the 1920s, the shipyard benefitted from increasing revenues from shipbreaking. Dozens of third canallers were bought, stripped, and their parts recycled. Salvaged materials from British- and U.S.-built steel ships set in motion a valuable trade in scrap metal within Niagara. Although operations on the third canal ended in the early 1930s, third-canal vessels could reach the Muir dry dock, through the still-operational Lock 1.

By 1946, the company was sold to the Port Weller Dry Docks, and the name later changed to the Port Dalhousie Shipyards. With the expansion of Port Weller, the Port Dalhousie Shipyards were shuttered in the mid-60s. No longer requiring access to Martindale Pond and given the high maintenance costs for Lock 1, the lock was officially closed on December 31, 1968. This marked the end of an era for canal shipping and wooden shipbuilding, which lasted 140 years across three historic canal routes. The hulks of several of these ships were abandoned nearby, along the shoreline of Lake Ontario at Port Dalhousie, and within Martindale Pond.[151] Public policy regarding ship abandonment and its impact on the environment was not regulated in Canada until 1999, however, it is likely that the economic value of machinery including diesel tanks, led to their removal prior to ship abandonment.[152]



Muir Brothers Dry Dock Company at Port Dalhousie 1920. Courtesy Brock University Map, Data, and GIS Library.

Port Weller

The development of facilities at Port Weller coincided with the construction of the Fourth Welland Canal. The Canadian government had built a dry dock between locks 1 and 2, for storage and repair work, although use was minimal. The lease of the Port Weller Dry Docks and adjacent federal land in April 1946 to Charles Ansell, would spur construction, rebuilding, and repair of commercial and naval ships. The first three ships commissioned were Lakers for Colonial Steamships Ltd. at Port Colborne, the *Scott Misener* (1951; renamed *John E.F. Misener* in 1954) the *John O. McKeller* (1952) and the *Scott Misener* (1954).

In 1956, Upper Lakes Shipping Ltd., took over lease of the property, continuing in the construction of new ships and support for ship repair. Throughout its operation, Upper Lakes built 42 ships that included icebreakers, bulk carriers, tankers, and scows. By the 1990s, Port Weller, now leased by Canadian Shipbuilding & Engineering, was the only facility actively building ships on the Great Lakes, employing about 700 people.[153] The economic downturn, however, forced the Port Weller Dry Docks into bankruptcy in 2006. Attempts to restructure led to a lease by Seaway Marine & Industrial Inc., before shutting down in 2013. The closure, combined with a general decline in the marine industry, severely impacted the canal communities.

The St. Lawrence Seaway Corporation briefly let the property to Algoma Corp., before Heddle Marine (now Ontario Shipbuilding) leased the Port Weller Dry Docks in 2017. Ontario Shipbuilding continues a 200-plus-year tradition of shipbuilding, repair, and marine fabrication on the Niagara Peninsula. Recent investment by the Ontario government will increase capacity for Port Weller by providing training in the shipbuilding trades, and through modernizing facilities, thereby promoting new manufacturing, and ensuring Ontario shipyards remain competitive.[154]

Port Colborne

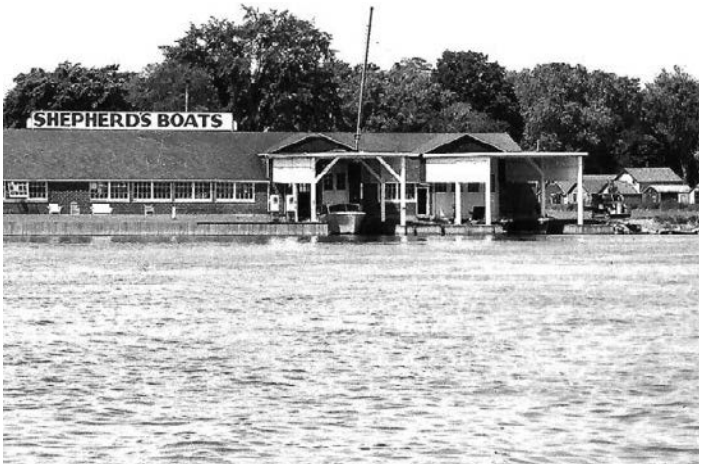
Port Colborne's shipbuilding industry was limited to repairs and cabin work on bulk freighters and passenger vessels after 1900. In 1920, J. A. Grant & Sons established a repair facility and dry dock, constructing several new builds before 1950.[155] Shipbreaking would increase at Humberstone and Port Colborne, coinciding with the increasing number of decommissioned vessels by the 1950s. Marine Salvage Ltd., originally based at Toronto, would become the primary concern at Port Colborne beginning in 1959, with over 170 ships having been broken up at this facility. The company's expansion and rebranding as Marine Recycling Corporation, continues to support end-of-life ship recycling at Port Colborne.[156]

Motorboat and Yacht Manufacture

Boat and yacht manufacture had its start in the 1820s on the Great Lakes. Investment would increase from the 1840s with the formation of the first yacht clubs and increased demand for speed under sail. This would lead to the first building contract at a Niagara-area shipyard. The 90-ton yacht *Oriole* was launched at the Shickluna Shipyard in June 1872, built for W.C. Campbell, Robert Hunter and William Mulock, members of the Royal Canadian Yacht Club at Toronto.[157] The Chase Brothers at Port Colborne would be contracted by local brewers Henry Cronmiller and Thomas White, to build a steam yacht in 1888.[158] Niagara would continue to be frequented by yachts and play host to regattas through the 20th century, leading to the formation of yacht clubs at Port Dalhousie and later, Niagara-on-the-Lake.

Shepherd Boats Ltd.

Concerted efforts to manufacture motorboats and yachts began shortly before the Great Depression with the Shepherd Boat Works. The company operated from 1928 until 1978, based initially in St. Catharines, and relocating to Niagara-on-the-Lake in 1940. The company became a Canadian leader in the manufacture and sale of motorboats throughout Canada, the United States and in Europe. Business increased dramatically after the Second World War, when financial stability afforded broader public investment in recreational pursuits, with Shepherd becoming the largest employer at Niagara-on-the-Lake. The *Niagara Advance* reported that it was considered "a class of industry that gives Niagara wide and favourable publicity."[159]



Shepherd Boats, Niagara-on-the-Lake. Courtesy Niagara-on-the-Lake Museum.

The company increased production during the 1950s and 1960s, expanding its facilities and workforce. Acquired by the Trojan Boat Company of Lancaster, Pennsylvania, Shepherd Boats Limited developed a more aggressive U.S. sales campaign which was backed by the American sales force and maximum media coverage. Further expansion plans were in the works, but by 1978, the nature of the luxury cruiser industry had changed. It was becoming less practical to manufacture the boats in Canada for use in the United States, and economic problems impacted the company. Shepherd Boats Limited would close its two plants in the Niagara Peninsula in February 1978.[160]

Hinterhoeller Inc.

Yacht production in Niagara-on-the-Lake would develop alongside motorized boats. George Hinterhoeller, who first worked with Shepherd Boat Works in the mid-1950s, began to design yachts part-time. He established Hinterhoeller Inc., at Niagara-on-the-Lake, operating from 1963 until 1969. Making the transition from plywood to fiberglass, he produced a range of racing sloops and cabin cruisers, that would meet the needs of both professional and recreational yachting enthusiasts.

C&C Yachts

Yacht designers George Cuthbertson and George Cassian would partner with Hinterhoeller and others beginning in 1969, operating primarily out of the Hinterhoeller plant on Regent Street in Niagara-on-the-Lake.[161] "C&C Yachts" became a publicly held corporation in 1971, that was unique in the industry. The company was a source of national pride for Canada, competing head-on with U.S. builders. Fiberglass production was less expensive and less maintenance-intensive, which—combined with the energy crunch of the 1970s, precipitated by the OPEC oil embargo—made sailing more affordable than powerboating.[162] C&C built more than 7,000 boats over the next 17 years, profiting from a strong Canadian dollar, and advantageous tariffs—whereby U.S. boats sold in Canada were subject to a 17.5 per cent tariff, whereas Canadian boats sold in the U.S. paid only three per cent. By the end of 1973, the company had successfully penetrated the American market.[163] Most of the production burden was on the Niagara plant, which resulted in further expansions of the premises, and employment, while custom work was undertaken in Oakville.

Shop floor of C&C Yachts. Courtesy Robert Mazza Collection.

The company would expand internationally, manufacturing at Rhode Island by 1976, with another factory in West Germany by 1978. New ownership, a recession, and cultural change would impact the company during the 1980s. The company succumbed to the new 15-per-cent U.S. tariff and a strong U.S. dollar, which led to French manufacturers entering the North American market and sent C&C into receivership in April 1986. Despite business investment through the late 1980s and early 90s, a fire in 1994 would cripple production. While attempts were made to recover, the Niagara-on-the-Lake plant was closed in 1996 and C&C was sold to Tartan Yachts in Ohio.[164]

Hinterhoeller Yachts & Neptunus Yachts

George Hinterhoeller, who had left the partnership in 1975 (complaining, "that he spent more time in the boardroom than building boats") formed Hinterhoeller Yachts, which operated at St. Catharines, off Keefer Rd., from 1977 until 1985. For his contributions to "sailing, yacht construction and job creation," Hinterhoeller was bestowed an honorary doctorate from Brock University.[165] In the 1980s, the Keefer Road facility was acquired by Neptunus Yachts, continuing the long-standing tradition of yacht design and manufacturing in the Niagara region.[166]

Harber Manufacturing/KingFisher

Harber Manufacturing Ltd. Have been involved in aluminum boat manufacture at Fort Erie since 1959. The company has evolved over the past 60 years, expanding its production line, and acquiring facilities in the U.S to extend its manufacturing capabilities. It is considered the leading brand of welded heavy-gauge aluminum boats in Canada. The company rebranded to KingFisher in November 2012, and currently employs about 180 people.[167]

Conclusion

The Niagara region was one of the earliest centres for shipping and shipbuilding on the Great Lakes. Its geographic position led to many early achievements in the history of inland navigation, while laying the foundations for marine commerce on the Great Lakes. The four incarnations of the Welland Canal have enabled access to key staple markets, which have supported Canada's economic development.[168] Construction, manufacturing, and marine services led to the development of canal communities that continue to shape this region. Niagara shipyards were particularly important to shipping and manufacturing, supporting the export of high-volume, low-value bulk cargoes on the Great Lakes-Atlantic route. The transition from wood to iron, and sail to steam, spurred developments that have shaped the region's current marine sector.

Marine transportation remains an important catalyst for Niagara's economic development, while continuing to support other economic sectors in Niagara. Over the past 20 years, the Fourth Welland Canal has conveyed between 27 and 34 million tons of freight per year.[169] The canal reduces carbon emissions on our highways, and provides us with the safest, most cost-efficient and environmentally friendly mode of bulk transport. It also provides local businesses and farmers a direct and reliable source of transportation to ship and receive their goods.[170] It supports Ontario's economic growth through both imports and exports, while fostering an environment for marine industry-related businesses to expand and thrive.

The future of Niagara's marine transportation is not without its challenges. Over the past two decades,

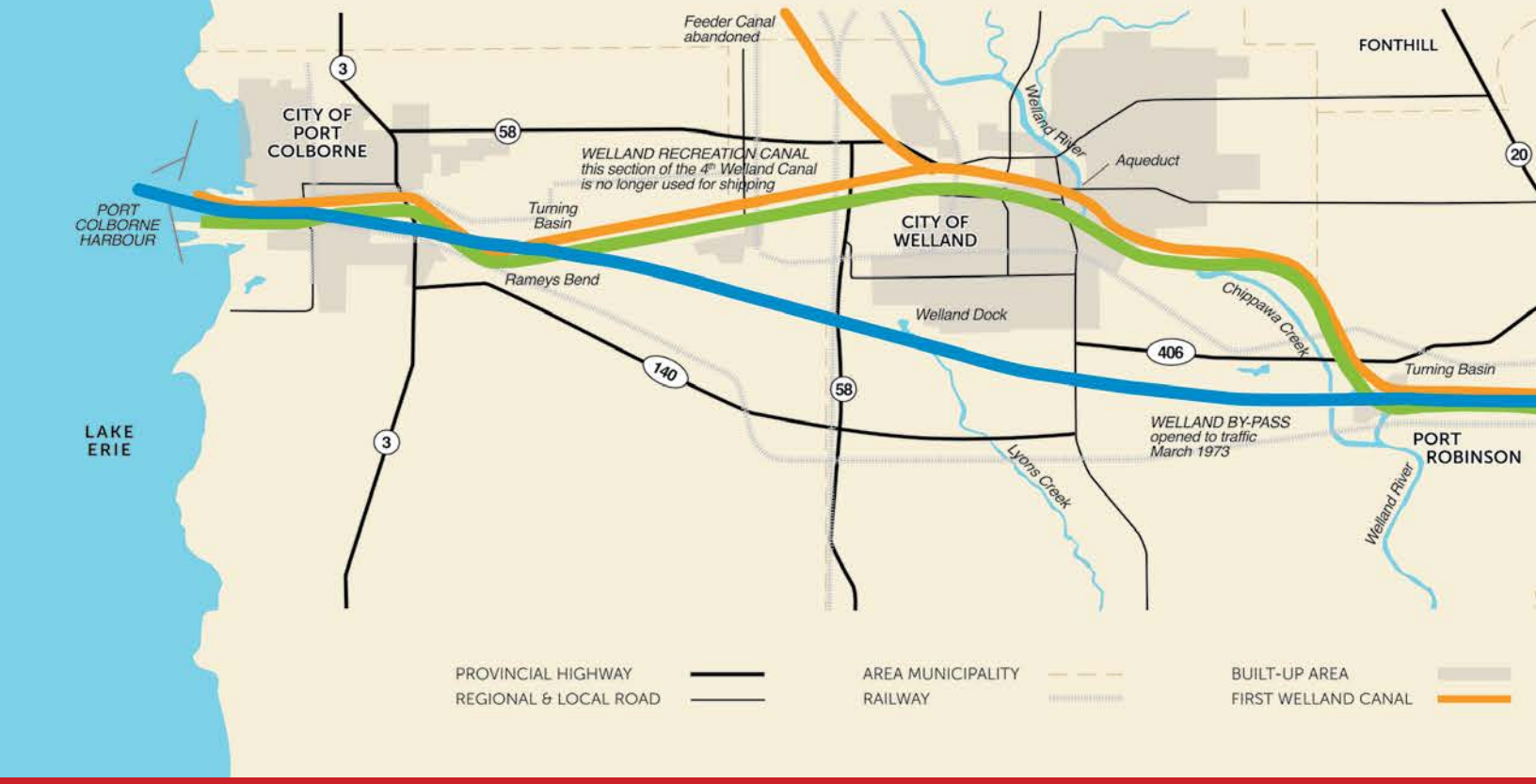
Niagara Welland Canal Corridor. Courtesy Tourism St. Catharines.

EVOLUTION OF THE WELLAND CANAL

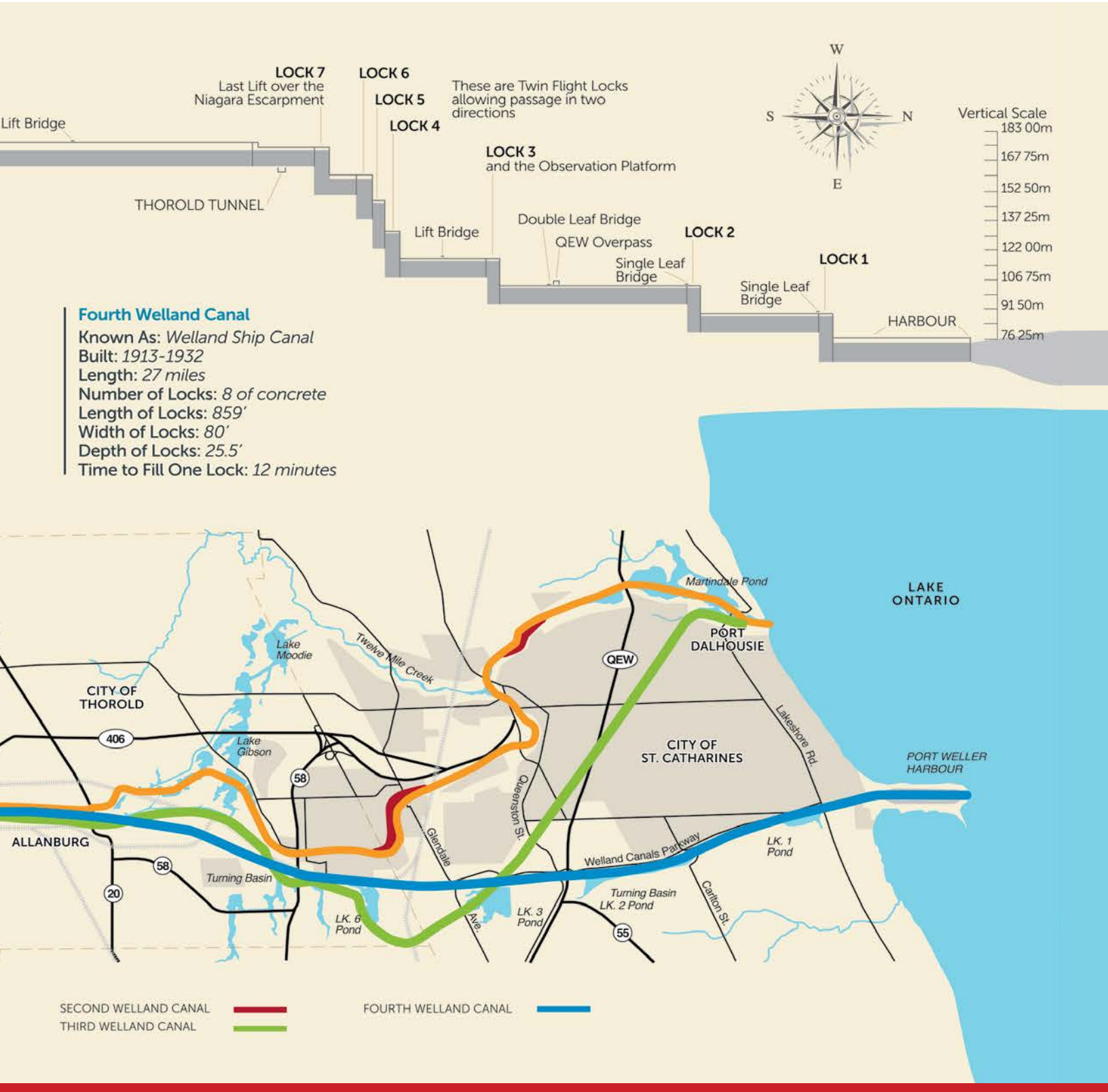
First Welland Canal
Known As: *First Welland Canal*
Built: *1824-1833*
Length: *28 miles*
Number of Locks: *40 of oak timber*
Length of Locks: *110'*
Width of Locks: *22'*
Depth of Locks: *8'*

Second Welland Canal
Known As: *Old Welland Canal*
Built: *1842-1853*
Length: *28 miles*
Number of Locks: *26 of masonry*
Length of Locks: *150'*
Width of Locks: *26.5'*
Depth of Locks: *12'*

Third Welland Canal
Known As: *New Welland Canal*
Built: *1872-1887*
Length: *23 miles*
Number of Locks: *25 of masonry*
Length of Locks: *270'*
Width of Locks: *45'*
Depth of Locks: *14'*



Ontario's marine sector has experienced a decline in employment opportunities, reducing the region's competitiveness toward achieving Canada's shipbuilding strategy.[171] Additional environmental, social, and economic factors led to regional stagnation, but these factors are symptomatic of changes that increase and recede within the history of regional development. As Ontario implements its new marine strategy, the Niagara region continues to build on its historic foundations, reestablishing itself as a key competitor in boat and ship manufacture while its communities continue to support shipping and services along the route of the Welland Canal. By doing so, Niagara recognizes and celebrates the history and heritage of its waterways, which continue to be places of both industry and recreation.



Endnotes

[1] Ontario Government, *The Future of the Great Lakes Economy: Ontario's Marine Transportation Strategy* (Ottawa: King's Printer for Ontario, 2023), 13–18.

[2] Ontario Government, *The Future of the Great Lakes Economy: Ontario's Marine Transportation Strategy* (Ottawa: King's Printer for Ontario, 2023), 19.

[3] Alan Hughes, "On the Meaning of "Niagara," *Newsletter of the Historical Society of St. Catharines,* June 2010, 7–10.

[4] The formation of the Grand River Navigation Company in 1834, forced further land cessations, previously granted to the Six Nations, along the intended route. *Tekawennake News* (Ohsweken, Ontario), April 15, 1992, 3.

[5] Louis Hennepin, *A New Discovery of a Vast Country in America, Extending above Four Thousand Miles, between New France and New Mexico. With a Description of the Great Lakes, Cataracts, Rivers, Plants, and Animals* (London: Printed for M. Bentley, I. Tonson, H. Bonwick, T. Goodwin, and S. Manship, 1698), 49.

[6] Fort Conti was short lived and burned within the same year of construction (1679). Later forts on this site that would further encourage trade with the Niagara region, included Fort Denonville (1687–88) and Fort Niagara (French 1726–, English 1759–, American –1963).

[7] The Provincial Marine, originating as a Royal Navy detachment, was established during the Seven Years' War, charged with the support and maintenance of British interests on North America's inland waterways. Initially tasked with manning armed vessels that could cover the advance of the British army; after the War of 1812, its role focused on transporting troops and supplies with limited armed operations.

[8] Robert Malcolmson, *Warships of the Great Lakes 1754–1834* (Annapolis, MD: Naval Institute Press), 29–30.

[9] George Seibel, *The Niagara Portage Road: A History of the Portage on the West Bank of the Niagara River* (Niagara Falls: City of Niagara Falls, 1990). By the 1830s, the route would be impacted by the Welland Canal. This spurred the Erie and Ontario Railway which began operations in 1845, facilitating faster shipment and passenger services connecting Queenston, Chippawa and Clifton (later Niagara Falls).

[10] Library and Archives of Canada, Upper Canada Land Petitions "M" Bundle 1, Petition Number 131 (Niagara, 11 Jul 1795); David Hemmings, *The House of McFarland: A Master Shipwright's Legacy* (Niagara-on-the-Lake: Bygones Publishing, 2011).

[11] "English Policy Toward America in 1790–1791." *The American Historical Review*, vol. 8, no. 1 (1902): 78–86.

[12] Arthur Doughty & Duncan McArthur, *Documents relating to the Constitutional History of Canada*, vol. II (Ottawa: C.H. Parmelee, 1914).

[13] Frederich Armstrong, "Ports of Entry and Collectors of Customs in Upper Canada, 1797–1841." *Inland Seas* vol. 26 no.2 (1970): 137–44.

[14] Thomas Dickson was the first collector at Queenston and John Warren was the first collector of customs at Fort Erie in 1801. While in 1803, James Muirhead became the first collector of customs at Chippawa.

[15] Legislative Assembly, Order in Council "Instructions Relating to Trade and Navigation," April 4, 1787; Robert Prescott, "Plan shewing the situation & dimensions proposed for building lots for merchants & traders on the Kings reserved land near the west landing on the Niagara River in the Province of Upper Canada," 1798.

[16] Upper Canada Statutes, 43 Geo. III, chap. 2 (Collection and Payment of Duties), sec. 7–8.

[17] Statistics Canada, *Censuses of Canada 1665 to 1871* (Ottawa: I.B. Taylor), 86. The Census of 1825 indicates 18, 269 people were settled in Niagara County, which at this time encompassed portions of Haldimand. After 1826, York would swiftly become the highest populus within Upper Canada. By the Act of the Union in 1841, Niagara's population was 36,642 people, but just after Confederation in 1871, Lincoln and Niagara's population fell to 21, 242.

[18] "Packet Between Fort George and York" *Kingston Gazette* (Kingston, ON), October 25, 1816.

[19] These ships included the PS (paddle steamer) *Frontenac* launched in 1816 near Kingston, the PS *Ontario* launched at Sacket's Harbor, NY and the PS *Walk-in-the-Water* launched at Black Rock, Buffalo.

[20] The fare for cabin passengers from Sackett's Harbor to Ogdensburg was $5—and to Niagara $10. *Niles Weekly Register* (Baltimore, MD), March 29, 1817.

[21] Walter Lewis, "The Steamer *Toronto* of 1825." *FreshWater* vol. 1 no. 2 (Autumn 1986), 26–29.

[22] Walter Lewis, "Line Development and the Passenger Steamboat Trade on Lake Ontario and the Upper St Lawrence River, 1829–1875", *The Northern Mariner* vol. 29 no. 2 (2019), 138.

[23] The following marine charts were based on these early surveys y Captain W. F. W. Owen, R.N., and Lieutenant (later Commander) H.W. Bayfield, R. N. Survey of Lake Erie in the years 1817 & 1818, Survey of the Grand River Entrance, November 1815, Lake Erie. ; A Survey of the River Niagara in the year 1817.

[24] Peter Russell, "Forest into Farmland: Upper Canadian Clearing Rates, 1822–1839," *Agricultural History*, vol. 57 (1983), 326–329.

[25] *Niagara Spectator* (Niagara, ON), June 27, 1817; *Buffalo Emporium* January 15, 1825, 2–3; *Black Rock Gazette* (Buffalo, NY), June 22, 1826, page 2; *Farmer's Journal & Welland Canal Intelligencer* (St. Catharines, ON), August 29, 1827.

[26] Janet Dorothy Larkin, *Overcoming Niagara: Canals, Commerce, and Tourism in the Niagara-Great Lakes Borderland Region*, 1792–1837 (Albany, NY: State University of New York Press, 2018), 23.

[27] Statistics Canada, *Censuses of Canada 1665 to 1871* (Ottawa: I.B. Taylor), 92, 101.

[28] W.H. Smith, Smith's Canadian Gazetteer: Comprising Statistical and General Information Respecting All Parts of the Upper Province, or Canada West (Toronto: H. & W. Rowsell, 1846), 129.

[29] A diversified portfolio was crucial to the merchant forwarders based on the Niagara River for weathering the impact of the Welland Canal route. Savvy businessmen such as Samuel Street had started his business in milling and shipping on the Niagara River in the 1790s,

invested in the Welland Canal Company by 1832, becoming a director of the Grand River Navigation Company, and held a monopoly on land holdings in the Dunnville area. See Bruce Parker, "Street Samuel (1775–1844)," in *Dictionary of Canadian Biography*, vol. 7, University of Toronto/Université Laval, 2003.

[30] Supplementary Annual of the Board of Directors of the Welland Canal Company, June 6, 1829 (St. Catharines: H. Leavenworth), 1829.

[31] "Yachting Notes: The Niagara Regatta: A Fine Day of Yachting Sport." *The Globe*, September 13, 1875, 4.

[32] G. M.Gibson, "Justice Delayed is Justice Denied: The Lord Nelson Case", *Ontario History* vol. 108 no. 2 (2016), 157–158.

[33] Bruce Parker, "The Niagara Harbour and Dock Company", *Ontario History* vol. 72 no. 2 (1980), 94.

[34] Bruce Parker, "The Niagara Harbour and Dock Company", *Ontario History*, vol. 72 no. 2 (1980), 96–102. A wet dock is an artificial basin that ensured sufficient water to float vessels while providing better security for harbour operations.

[35] *Daily News* (Kingston, ON), July 16, 1853.

[36] Bruce Parker, "The Niagara Harbour and Dock Company", *Ontario History*, vol. 72 no. 2 (1980), 114–116.

[37] Shickluna would manufacture the last ship launched from the Niagara Harbour and Dock's facility in 1864, the passenger steamer *City of Toronto*; *St. Catharines Constitutional* April 21, 1864.

[38] Coincidentally, 1864 was also when St. Catharines replaced Niagara-on-the-Lake as the county town of Lincoln, highlighting the importance of St. Catharines by this period, due to shipping and manufacture on the Welland Canal.

[39] John P. Heisler, *The Canals of Canada. Canadian Historic Sites: Occasional Papers in Archaeology and History* no. 8, 1973.

[40] *Journals of the Legislative Assembly of Upper Canada* (1818), November 14.

[41] *Journals of the Legislative Assembly of Upper Canada* (1818), November 6 and November 17.

[42] The Erie Canal was completed in 1825, becoming the first navigable waterway to reach the Atlantic. Although limited to canal barges, shipping remained competitive with the Welland Canal, until the opening of the St. Lawrence Seaway.

[43] *Journals of the Legislative Assembly of Upper Canada* (1821), March 31.

[44] Alan Hughes, "Early Shipping and Shipbuilding on the Twelve," *Newsletter of the Historical Society of St. Catharines* (2008), 8–9.

[45] This refers to vessels that were carrying bulk goods, such as wheat poured into the hold, as opposed to goods shipped in containers. Detroit Gazette (Detroit, MI), February 4, 1830, 2.

[46] *The Annual Report of the Board of Directors of the Welland Canal Company* (St. Catharines: M. Leavenworth, 1835), 29–30.

[47] *Montreal Gazette*, May 5, 1835. This predates the "top hat" tradition in Ontario, previously credited to Hugh Richardson at Toronto, in 1861.

[48] Brock University Archives & Special Collections, *Roberta Styran Fonds 1707–2013*. RG 544. Box 9 Folder 17.

[49] Alan Hughes, "The Communities of the "First" First Welland Canal.," *Newsletter of the Historical Society of St. Catharines*, June 2007, 6–8; Alan Hughes, "The Feeder Canal and Its Communities," *Newsletter of the Historical Society of St. Catharines*, September 2007, 6–9.

[50] Robert Randall, *First General Report from Robert Randall, Commissioner: An Act to Grant a Further Loan to the Welland Canal Company and to Regulate Their Further Operations* (York [Toronto): J. Baxter, February 8, 1831).

[51] The exception was the Grand River feeder, which continued to be used. John Jackson, "The Construction and Operation of the First, Second, and Third Welland Canals." *Canadian Journal of Civil Engineering* vol. 18 no. 3 (1990).

[52] *Upper Canada Herald* (Kingston, ON), April 28, 1835; *British Whig* (Kingston, ON), Dec. 15, 1835.

[53] Ruth Bleasdale, "Class Conflict on the Canals of Upper Canada in the 1840s." Labour vol. 7 (Spring, 1981), 26–27.

[54] *St. Catharines Journal*, September 20, 1844.

[55] Roberta Styran & David Taylor, *This Great National Object: Building the Nineteenth-Century Welland Canals* (Montreal: McGill-Queens University Press, 2012), xiv.

[56] Canada (Province) Statutes, 1841–42. "An Act to repeal certain Ordinances therein mentioned and to establish a Board of Works in this Province" (4 and 5 Vic., C. 38); Canada (Province) Statutes, 1841–42, "Act to authorize the raising by way of Loan in England, the sum of One Million Five Hundred Thousand Pounds, sterling, for the construction and completion of certain Public Works In Canada" (6 Vic., C. 8).

[57] The ship basin is now known as Martindale Pond. *Argus* (Kingston, ON), April 7, 1848, 3; *Daily News* (Kingston, ON), March 15, 1853; *St. Catharines Post* (St. Catharines, ON) Aug. 21, 1855; Library and Archives of Canada, *Welland Canal Registers for Lock 3*, 1875–1877, RG 43 Vol. 2406.

[58] Robert Taylor, "The Growth of Merritton's Industrial Corridor, ca. 1845–1914" *Industry in the Niagara Peninsula: Proceedings Eleventh Annual Niagara Peninsula History Conference*, Brock University, 22–23 April 1989.

[59] Statistics Canada, *Census of the Canadas, 1851–2: Agricultural Produce, Mills, Manufactories, Houses, Schools, Public Buildings, Places of Worship, &c., Vol II*. (Quebec: Lovell and Lamoreaux, 1855), 217.

[60] The Lachine Canal was opened in 1825, to bypass the rapids upstream of Montreal, which enabled passage through the St. Lawrence without portaging. The canal was however limited by its draft of 1.5 m (4.9 ft) before 1849.

[61] *Chronicle & News* (Kingston, ON), September 1, 1849. T.R. Meritt established a regular line of three ships running through the Welland Canal to Montreal or to Halifax, each ship performing the trip within two weeks. The *L.S. Shickluna*, *New Brunswick*, and *Welland*, were manufactured at the Shickluna Shipyard.

[62] *Liverpool Daily Post* (Liverpool, England) 23 July 1860; *Morning Post* (London) Oct 29, 1860.

[63] *Weekly Chronicle & News* (Kingston, ON), Dec 10, 1858.

[64] James Huston, "Western Grains and the Panic of 1857." *Agricultural History* 57, no. 1 (1983), 20.

[65] It is a credit to Louis Shickluna that within a year, he had paid down the debt, and repurchased the property.

[66] Martin Associates, *Economic Impacts of Maritime Shipping in the Great Lakes-St. Lawrence Region* (July 2023).

[67] "Schooner Days" *Toronto Telegram* (Toronto, ON), 24 Dec 1932

[68] *Oswego Commercial Times* (Oswego, NY), March 2, 1861; *Daily British Whig* (Kingston, ON), March 15, 1861; *Daily British Whig* (Kingston, ON), March 21, 1861; *Daily British Whig* (Kingston, ON), April 29, 1862; *Daily British Whig* (Kingston, ON), April 8, 1861.

[69] *British Whig* (Kingston, ON), May 23, 1911; *Toronto Telegram* (Toronto, ON), June 23, 1945.

[70] Edgar Mclnnis, Canada: *A Political and Social History* (Alcester, UK: Read Books, 2007),

[71] Patrick Alexander and Ian Keay, "Responding to the First Era of Globalization: Canadian Trade Policy, 1870–1913" (Working Paper, Bank of Canada, 2018), 2; *St. Catharines General and Business Directory* (St. Catharines: Holmes' Excelsior Printing House, 1874), 20.

[72] Library and Archives of Canada, *Welland Canal Register, Vessel Registers Lock 3* (1854–1858) RG 43 Vol. 2403, (1875–1877) RG 43 Vol. 2406 (1882–1885) RG 43 Vol. 2411.

[73] *Marine Record* (Cleveland, OH), August 18, 1892, 7.

[74] Randy William Widdis, "'Across the Boundary in a Hundred Torrents': The Changing Geography of Marine Trade Within the Great Lakes Borderland Region During the Nineteenth and Early Twentieth Centuries." *Annals of the Association of American Geographers* vol. 101, no. 2 (2011), 357.

[75] Brock University Archives & Special Collections, *Roberta Styran Fonds 1707–2013*. RG 544. Box 9 Folder 36.

[76] The 1871 Canadian Census of Industrial Establishments indicates that women and girls under 16 were primarily employed in textile production, paper mills, and millinery. See Canadian Industry in 1871 Project (CANIND71), University of Guelph, Ontario, 1982–2008.

[77] W.H. Smith, *Canada: Past, Present and Future Being a Historical, Geographical, Geological and Statistical Account of Canada West, vol. 1* (Toronto: Thomas Maclear, 1851). In 1851, the population at St. Catharines, Welland, and Thorold, were 3400, 1500 and 1200 people, respectively. While populations at Port Dalhousie and Port Colborne were 200 and 160 people.

[78] Born in Scotland in 1809, John Brown apprenticed as a stone mason in Glasgow, before emigrating to New York in 1832. He worked on the Erie Canal and on other New York building projects, before settling at Queenston in 1838. There, he opened the Queenston Quarry, later moving to Thorold in 1843, where he would contract his services across building projects for the second and third canal. He is also known for leading other significant marine projects in Canada West, including the Imperial Towers, a series of six Great Lakes lighthouses, before his passing in 1876.

[79] Statistics Canada, *Censuses of Canada* 1851–1901 (Ottawa: I.B. Taylor). The Quackenbush family operated at least 14 tugs, including the *John W. Gordon*, *John Brown*, *Young Lion*, and *John S. Noyes*, which operated on the canal, and in towing vessels across the lakes. For vessel particulars, see John Mills, *New Mills List: Canadian Coastal and Inland Steam Vessels*, 1809–1930.

[80] St. Catharines Museum at Lock 3. Norris Papers—1851–1863, Receipts and Invoices. MG A,7, a, 50.

[81] *Farmer's Journal & Welland Canal Intelligencer* (St. Catharines, ON), January 4, 1831; *Farmer's Journal & Welland Canal Intelligencer* (St. Catharines, ON), May 17, 1832; *St. Catharines Journal*, April 4, 1851.

[82] *St. Catharines Journal*, March 28, 1861; St. Catharines Journal, June 12, 1861.

[83] Further accounts are limited concerning the dispute. Given that the ship carpenters employed in Shickluna's yard hosted a ball at the Welland House to celebrate the launching of the barkentine *Cambria* in March 1862, it is presumed working relationships had improved by autumn 1861 to effect construction. *St. Catharines Evening Journal*, March 28, 1862.

[84] *British Whig* (Kingston, ON), April 19, 1879. The St. Catharines movement was spurred by developments at Chicago (1878) and Kingston (1879).

[85] *Daily British Whig* (Kingston, ON), October 10, 1879, 3.

[86] *St. Catharines Constitutional*, April 2, 1856.

[87] Beginning in the 1860s, boards of trade were established to stimulate more localized economic activity, notably manufacturing, but also to shape policy and procure new infrastructure to support industry. The St. Catharines Board of Trade was officially incorporated in 1872, although its members held meetings regarding trade as early as 1865. Membership within St. Catharines board was unique, whereby eligible occupations for board of trade membership included the "owner or master of any vessel or master builder." Elizabeth Bloomfield, "Boards of Trade and Canadian Urban Development." *Urban History Review* 12, no. 2 (1983): 79; *St. Catharines Constitutional* June 22, 1865; Thomas R. Merritt, Private Bill: *An Act to Incorporate "The St. Catharines Board of Trade."* House of Commons. No. 43. 5th Session, 1st Parliament, 35 Victoria, 1872. (Ottawa: I.B. Taylor, 1872).

[88] The formation of the Canadian Shipowners Association, "by the owners of vessels to consider the laws at present existing in Canada as insufficient for the due protection of the interest of said owners, and advancement of the inland navigation and general shipping." *St. Catharines Constitutional*, November 5, 1856.

[89] *Seaway Compass* (Spring 2022), 1-2. The Viking expedition cruise ships *Octantis* and *Polaris* are both 202.7 m (665 ft) in length with a 23.5 m (77 ft) breadth and would have required permission to transit the canal due to their maximized breadth. Regulations state that vessels navigating the Fourth Welland Canal must be no greater than 222.5 m (730 ft) in overall length or 23.16 m (76 ft) in extreme breadth. Under certain conditions, vessels up to 225.5 m (740 ft) in overall length and 23.8 m (78 ft) in extreme breadth, may be allowed to transit. See Canadian Sailing Directions, Welland Canal and Lake Erie (Ottawa: Canadian Hydrographic Service, Fisheries and Oceans, 2024), 10.

[90] The pollywog sidewheel steamer Dart (1841) was employed on the Montreal-Ottawa-Kingston route; *British Whig* (Kingston, ON), September 9, 1842, 4.

[91] The earliest propeller to serve and benefit from the Welland Canal trade was the 138-ton Vandalia, built at Oswego, New York in 1841. The Niagara Harbour and Dock would manufacture the region's first propeller, the *Adventure*, in 1843.

[92] Alan Hughes, "Early Shipping and Shipbuilding on the Twelve," *Newsletter of the Historical Society of St. Catharines* (2008), 10.

[93] *St. Catharines Constitutional*, July 23, 1856.

[94] John Mills, *New Mills List: Canadian Coastal and Inland Steam Vessels*, 1809–1930.

[95] *St. Catharines Constitutional*, July 7, 1864; *St. Catharines Constitutional*, August 25, 1864.

[96] *Farmer's Journal & Welland Canal Intelligencer* (St. Catharines, ON), January 10, 1827, 3.

[97] *Upper Canada Herald* (Kingston, ON), December 22, 1830, 3.

[98] *Appendix to the Journal of the House of Assembly of Upper Canada of the second session of the twelfth provincial Parliament* (Toronto: W. L. Mackenzie, 1836). In June 1831, the board confirmed a lease "to Messrs. Merritt and Donaldson, for a dry dock."

[99] Records suggest that this may be the oldest graving (dry) dock on the Great Lakes.

[100] The 1871 Canadian Census of Industrial Establishments lists Louis Shickluna as the fourth leading employer in Niagara with 82 persons employed, and 25 thousand dollars allocated toward wages. In comparison, Gordon and Mackay's Lybster Cotton Mill employed 200 persons, with 36 thousand expended on wages, Tuttle, Date and Rodden manufacturing agricultural tools, employed 120 persons, expending 55 thousand on wages, and John Riordan's paper mills with 100 employees and disbursing 90 thousand on wages. *Canadian Industry in 1871 Project* (CANIND71), University of Guelph, Ontario, 1982–2008.

[101] *Montreal Gazette* (Montreal, QC), September 30, 1846.

[102] *Buffalo Commercial Advertiser*, June 30, 1884, 3-5.

[103] Library and Archives of Canada. *Privy Council Minutes* 23–25 January 1893 (RG 2 Series 1 Volume 544).

[104] *St. Catharines Journal*, March 10, 1859, 2

[105] M. Beatty & Sons, *Illustrated Catalogue of Contractors' Plant Manufactured by M. Beatty & Sons* (Welland, 1888).

[106] "Welland Now and Then: Beatty & Sons Rose from Forging Farm Tools to Building Boats." *Welland Tribune*, Feb 28, 2020.

[107] *Daily News* (Kingston, ON), September 15, 1871, 2; *Daily News* (Kingston, ON), May 3, 1872, 2.

[108] Robert Taylor, "Merritton, Ontario: The Rise and Decline of an Industrial Corridor (ca. 1845–1939)" *Scientia Canadensis*, vol. 14 no. 1–2 (1990), 104.

[109] *Marine Record* (Cleveland, OH), July 25, 1895, 6.

[110] *British Whig* (Kingston, ON), October 21, 1901.

[111] *Marine Review* (Cleveland, OH), October 5, 1905, 37.

[112] O.M. Meehan, "The Canadian Hydrographic Service From the time of its inception in 1883 to the end of the Second World War" *The Northern Mariner*, Volume 15, 27–47.

[113] Edward L. Mills, Joseph H. Leach, James T. Carlton, Carol L. Secor, "Exotic Species in the Great Lakes: A History of Biotic Crises and Anthropogenic Introductions," *Journal of Great Lakes Research* vol. 19 no. 1 (1993).

[114] Zahra Labbaf, "Identifying the Potential Sources of Contaminants to the Welland Canal, the Major Source of Drinking Water in the Niagara Region" (Unpublished MA Thesis, Toronto Metropolitan University, 2010); Walter B. Langbein, "Hydrology and Environmental Aspects of Erie Canal (1817–99)," (Washington: U.S. Government Printing Office, 1975).

[115] "Interfering with Canada's Trade." *New York Times*, July 30, 1881, 4.

[116] *Marine Record* (Cleveland, OH), August 18, 1892, 7.

[117] *Marine Record* (Cleveland, OH), August 18, 1892, 7.

[118] Sessional papers of the Dominion of Canada: volume 15, third session of the sixth Parliament (Ottawa: B. Chamberlin, 1889).

[119] Sessional papers of the Dominion of Canada: volume 8, third session of the eighth Parliament (Ottawa: S.E. Dawson, 1899); *Green's Marine Directory of the Great Lakes*, 1915, 430.

[120] *Canada Yearbook 1913* (Ottawa: J. De L. Tache, 1913). Between 1891 and 1911, St. Catharines population increased from 9 to almost 12.5 thousand people. Although the number of businesses decreased from 108 to 58 establishments, overall capital rose from 1.7 million to 5.9 million, and labour from 1.3 to 3.1 thousand employees.

[121] *Green's Marine Directory of the Great Lakes*, 1940, 190.

[122] Diesel electric propulsion was first introduced on the Great Lakes in 1908, though manufacture remained primarily coal-fueled until the 1930s. *Marine Review* (Cleveland, OH), January 1928, 25.

[123] *Marine Review* (Cleveland, OH), June 4, 1903, 22–23.

[124] *Green's Great Lakes & Seaway Directory*, 1964, 420.

[125] Alan Hughes, "Terrorist Attacks on the Welland Canal," *Newsletter of the Historical Society of St. Catharines*, June 2008, 6–10.

[126] William A. Smy, *Guarding Niagara: The Welland Canal Force*, 1914–1918 (Fort Erie, ON: William A. Smy, 2012).

[127] "The Port Colborne and St. Lawrence Navigation Company Limited", *Scanner*, v. 8, n. 2 (November 1975).

[128] *Thorold News*, November 28, 2023.

[129] *Canadian Railway and Marine World* June 1920, 324; *Canadian Railway and Marine World* December 1920, 680.

[130] Stephen Salmon, "This Remarkable Growth": Investment in Canadian Great Lakes Shipping, 1900–1959." *The Northern Mariner* vol. 15 no. 3 (July 2005), 37.

[131] *Green's Great Lakes & Seaway Directory*, 1964, 471.

[132] Statistics Canada, *Summary of Canal Statistics* (Ottawa: Dominion Bureau of Statistics, Transportation Division, 1932, 1940, 1950, 1960, 1969).

[133] Jaewoo Kim and Nicholas E. Mandrak, "Assessing the Potential Movement of Invasive Fishes through the Welland Canal," *Journal of Great Lakes Research* vol. 42, No. 5 (2016).

[134] Joseph Redinger and Rochelle Sturtevant, "*Balancing act: A policy success story in the Great Lakes*," Michigan Sea Grant, Michigan State University, February 23, 2024.

[135] Statistics Canada, Census of the Canada for 1931 (Ottawa: F.A. Acland) 1941 (Ottawa: Edmond Cloutier), 1951 (Ottawa: Dominion Bureau of Statistics) and 1961. (Ottawa: Dominion Bureau of Statistics).

[136] Alan Hughes, "The Early History of Merritton," *Newsletter of the Historical Society of St. Catharines*, 2013, 1–5; Alan Hughes," The Evolution of St. Catharines as a Municipality," *Newsletter of the Historical Society of St. Catharines*, September 2008, 1–7.

[137] "HOPA adds industrial properties in Port Colborne, Thorold." *ConstructConnect*, November 7, 2023.

[138] United States Patent Office, *Fairlead for Cables and the Like*, January 16, 1934. The Port Colborne fairlead was a revolving pulley installed through a ship's side through which a line is put ashore. The pulley turns as the ship moves through a lock, or up and down in the lock, so the line can move easily from the power winch on deck.

[139] Skip Gillham, *The Ships of the Misener Fleet* (Vineland, ON: Glenaden Press, 2005).

[140] Benjamin Ioset, "Before a Failing Breeze: Sailing Labor in the Final Years of Sail on the Great Lakes." *The Northern Mariner* vol. 32, no. 2 (2022), 185.

[141] By 1938, the CSU included 90 per cent of Great Lakes' seamen in its ranks, with 6,000 men having signed contracts with their employers.

[142] John Stanton, *Life & Death of a Union: The Canadian Seamen's Union, 1936–1949* (Toronto: Steel Rail Educational, 1978), 91.

[143] Reg Whitaker & Gary Marcuse, *Cold War Canada: The Making of a National Insecurity State, 1945–1957* (Toronto: University of Toronto Press, 1996), 174.

[144] *Scanner*, v. 37, no. 1 (October 2004), 9. A few large companies established their dominance within the Great Lakes region by the 1930s. Determined to defeat the union (CSU), shipping companies relied on the support of the Canadian government to sign contracts with the (then corrupt) Seafarers' International Union.

[145] Stephen Salmon, "Rank Imitation and the Sincerest Flattery: the Dominion Marine Association and the Revision of the Canadian Coasting Regulations, 1922–1936." *The Northern Mariner*, vol. 1 no. 3 (July 1991), 1.

[146] *Scanner*, v. 21, no. 7 (April 1989), 6–11.

[147] *Canadian Railway and Marine World*, April 1918, 166; *Canadian Railway and Marine World*, February 1919, 102.

[148] Fort Erie Public Library, Local History Archives, "Horton Steel Fonds."

[149] Museum of the Great Lakes, "Canadian Dredge and Dock Fonds."

[150] *Canadian Railway and Marine World* September 1917, 374; *Canadian Railway and Marine World*, February 1919, 99–100.

[151] An underwater archaeological survey of these hulks is c urrently ongoing, to ascertain the identity of the ships and assess the physical remains.

[152] Parliament of Canada, Canadian Environmental Protection Act, 1999, S.C. 1999, c. 33.

[153] Report by Mr. John M. Banigan (Assistant Deputy Minister, Department of Industry), Standing Committee on Industry, House of Commons, November 16, 1999. The report reasons that the shipbuilding industry in Canada had been undergoing a rationalization, in the face of somewhat difficult market conditions, since the mid-1980s, that led to the closure of shipyards at Collingwood (1986) and later Port Arthur (2003).

[154] Ontario Government, "Ontario Training Next Generation of Shipbuilders in Hamilton." *News Release*, July 13, 2023.

[155] The Shipbuilding Industry. *Annual Industry Report* (Ottawa: Dominion Bureau of Statistics, Industry and Merchandising Division, 1948).

[156] "Great Lakes Shipbreaking: Canada's MRC Provides Clean, End-of-Life Ship Recycling." *Great Lakes Seaway Review*, June 6, 2022.

[157] "Pleasure Yacht Launched." *Globe and Mail*, June 20, 1871, 1. Although built by Shickluna, the vessel was designed by Feversham of New York.

[158] Donald Anger, *Tales from the Age of Sail* (Port Colborne Historical and Marine Museum, 2006), 74-75; "Welland Then and Now: The folklore of brewers Cronmiller & White." *Welland Tribune*, January 31, 2020.

[159] "1949 Shepherd's Boats Popular Throughout Canada." *Niagara Advance*, June 2, 1949.

[160] "Niagara Plant to close in February." *Niagara Advance*, December 8, 1977, 9.

[161] Ian Coutts, "CY profile: George Anton Hinterhoeller," *Canadian Yachting* (1999), 12.

[162] Dan Spurr, "History C&C Yachts", *Good Old Boats*, 48–59.

[163] Dan Spurr, "History C&C Yachts", *Good Old Boats*, 54.

[164] Dan Spurr, "History C&C Yachts", *Good Old Boats*, 59.

[165] George Anton Hinterhoeller, Brock University Honorary Degree and Award Recipients, June 4, 1982, 39.

[166] "This St. Catharines luxury boat builder can equip yours with a salon and fireplace. Neptunus Yachts celebrates 35 years in business." *St. Catharines Standard*, July 11, 2024.

[167] "Harbercraft Rebrands as KingFisher," *Boating Industry Canada*, Nov 5, 2012; "Kingfisher Factory Tour." *BoatBlurb*, September 25, 2023.

[168] A visual history of the Welland Canal can be found in the following brochure: https://bit.ly/3LInWVQ

[169] The St. Lawrence Seaway Traffic Report 2023 Navigation Season (Ottawa: The St. Lawrence Seaway Management Corporation, 2024), 41.

[170] Maggie Murphy, "How Great Lakes Shipping Helps the Niagara Region Stay Afloat," (Chamber of Marine Commerce, August 2022).

[171] Government of Canada, *Canada's National Shipbuilding Strategy: 2021 Annual Report* (Ottawa: King's Printer for Ontario, 2021).