

The Story of Marine Transportation in Niagara, 1969 to Present Day

Introduction

Few projects have shaped the Niagara region as significantly as the Welland Canal. The original canal opened in 1829 and revolutionized transportation between the Great Lakes. By circumventing Niagara Falls, the canal facilitated the flow of goods from western ports like Detroit and Cleveland to the growing metropolises of Toronto and Montreal. The canal was also important to the emerging regional identity of Niagara, as investors from both sides of the border sought to use the canal to improve trade and economic growth within the region. As the historian Janet Larkin writes, “while the more distant colonial elite may have viewed the Welland Canal as a defensive measure against American transportation developments along the Niagara-Great Lakes borderland, the story of the Welland Canal’s building was one of Canadian-American cooperation and friendship (2019, p. 79–80).”

Over time, improvements to the canal system opened Niagara to the passage of larger ships and increased volumes of cargo, strengthening the region’s role as a nexus for marine transportation both in Canada and around the world. The opening of the St. Lawrence Seaway in 1959, for example, allowed ships to travel more easily from Montreal to Lake Ontario and solidified the importance of the Welland Canal to Canadian commerce. It also strengthened Canada’s role as a pioneer in the marine transportation sector and strengthened the country’s trade balance. A year after the Seaway opened, the amount of iron ore exported from Canada exceeded the amount imported for the first time (Jackson 1975).

The construction of the Welland Canal influenced life in Niagara. Firstly, the canal facilitated the rapid growth of Welland into the city it is today (Larkin 2019). The original canal also shifted the economic centre of the region from Niagara-on-the-Lake to the City of St. Catharines, which

now represents the only designated urban growth centre within Niagara (Larkin 2019; Niagara Region 2022). The legacy of the canal has remained constant even as the importance of the canal itself has ebbed and flowed, shaped by local and global trends.

Yet, the marine transportation sector in Niagara is not limited to the ships passing through the canal. The success of the canal has depended on—and given birth to—an ecosystem of manufacturers, logistics companies, and other marine-adjacent businesses in Niagara, whose products and services are key to the smooth functioning of the canal itself. As the pathway of the canal has shifted over time, with advancements in construction techniques allowing for gradual improvements to the canal’s original route, municipalities within Niagara have also learned to capitalize on old canal assets in new ways. From Port Dalhousie to Welland, remnants of the old canal system are being reimagined, carrying the history of the canal forward into the future. As we will see, the marine transportation sector in Niagara is also expanding beyond the canal itself, with innovative projects underway on both Lake Erie and Lake Ontario.

In this working paper, we tell the story of marine transportation in Niagara, from its incorporation as a regional municipality in 1969 to present day. We take stock of recent developments in marine transportation in Canada, and the implications of these developments for Niagara’s marine transportation sector. Once key to the emergence of Niagara as a corridor for trade and commerce, marine transportation continues to provide opportunity for innovation and economic development. This is especially true given emerging concerns around supply chain efficiency, sustainability, and resiliency in Canada. The legacy of the old canal is finding new life, as well, as local municipalities leverage historic sites to create new tourist initiatives across the region.

Nathan A Olmstead, PhD (ABD) | Post-Doctoral Researcher, Niagara Community Observatory | nolmstead@brocku.ca
Tia Henstra, BA | Research Assistant, Niagara Community Observatory
Charles Conteh, PhD | Director, Niagara Community Observatory | cconteh@brocku.ca

This research is funded by the Wilson Foundation, a multi-year partnership with Brock University and facilitated by the Niagara Community Observatory to map Niagara’s economic history and deepen the understanding of the region’s economic and social development. Principal Investigator: Dr. Charles Conteh.

www.brocku.ca/nco

1969–1980s

By the time the Province of Ontario passed the *Regional Municipality of Niagara Act* in 1969, the Welland Canal was already operating as a key “commercial artery” within Niagara (Jackson 1975). Commodities included wheat and iron, with companies in western Canada and the United States using the canal (and the still relatively new St. Lawrence Seaway) to reach markets in Quebec and around the world. In 1972, the opening of the Welland Canal Bypass diverted the canal away from downtown Welland. This accelerated shipping speeds, thus improving the efficiency and attractiveness of marine transportation for exporters both in Niagara and across North America. That same year, more than 64 million tons of goods and 6,778 transits passed through the Welland Canal (Jackson 1975).

While early industrialists like William Merritt were influential in the construction of the canal itself, the access the canal provided to global markets in turn gave rise to a manufacturing hub in Niagara. This connection between marine transportation and manufacturing was further strengthened in the 1960s and 1970s, as American automotive manufacturers came north in search of new markets (Jackson 1975). Most notable was the arrival of General Motors, who by the 1980s had reached a high of nearly 10,000 local employees (Fraser 2016).

The importance of the canal gave rise to an emerging ecosystem of supportive businesses and organizations related to marine transportation. By 1990, more than \$87 million in wages and 4,651 jobs were connected to the marine industry, with Port Weller Dry Docks serving as the largest employer (Niagara Region Development Corporation 1990). Niagara also became home to organizations like the Welland Canals Preservation Association, which formed in 1977 and was renamed the Welland Canals Society in 1979. With federal and provincial support, the group worked to preserve and celebrate old sections of the canal system. This included converting abandoned sections into walking paths and parks (Shiple 1999). Though economic and political challenges led the Welland Canals Society to dissolve in 1991, their efforts reflect the iconic position that the canal continued to occupy within Niagara (Shiple 1999).

In addition to supporting existing businesses, the Welland Canal has also been a driver of innovation within Niagara. This includes the canal itself, which allowed travellers and goods to overcome the natural barrier of Niagara Falls (Larkin 2019). Yet innovation did not end with the original

canal. In constructing the Welland By-Pass, for instance, Hydro One had to build two of the tallest transmission towers it had ever built to provide the necessary overage for passing ships (St. Lawrence Seaway 2003).¹ Around the same time, the flow of traffic through the canal was improved by the incorporation of CCTV and telemetry systems, both relatively new technologies at the time.² In turn, the success of the canal has turned Niagara into a cluster of marine service and suppliers, including the largest Canadian-owned dry docks facility on the Great Lakes: Heddle Shipyards (Niagara Economic Development 2022b).

In the years following the incorporation of Niagara Region, the Welland Canal has served as a commercial backbone for both the region and the country. For all its success, however, close connections between marine transportation and industry have left marine transportation vulnerable to more global economic trends. A recession in the early 1980s, for instance, left Niagara reeling, with unemployment in the region roughly four to five per cent higher than provincial and national averages (Niagara Region Development Corporation 1985). The impact of this economic slowdown was reflected in the canal. Between 1977 and 1987, the number of jobs directly related to Seaway activity decreased from 5,000 to 3,000, with another 4,000 jobs lost in adjacent services such as repairs, stores, and hotels (Niagara Region Development Corporation 1988). The tonnage passing through the St. Lawrence Seaway decreased from 66 million tonnes in 1979 to 42.7 million tonnes in 1987, with organizations in the area advocating for the removal of regulations in order to incentivize use of the Seaway and Canal (Niagara Region Development Corporation 1988). Automotive sales also decreased across North America, leading to slower growth in the region’s manufacturing sector and a drop in exports (Niagara Region Development Corporation 1990).

Other global shifts have also impacted Niagara’s marine transportation sector. The emergence of rail and trucking, for instance, supplanted marine transportation as the mode of choice for most local businesses (Ferguson 2020). These alternatives were better adapted to the just-in-time supply chains that emerged towards the end of the 19th century, as new forms of connectivity enabled better coordination between supply and demand. Marine remained slower than these other forms of transportation, while the seasonal operation of the canal presented another barrier for companies shifting towards year-round exchange. By the mid-1980s, marine transportation thus found itself in a moment of “structural change,” as technological shifts and global economic trends left the role of the canal in question.

¹ St. Lawrence Seaway Management Corporation, “The Welland Canal Section of the St. Lawrence Seaway,” 2003.

² *Ibid.*

1990s–2000s

Given the historical significance of the canal, it should come as no surprise that these challenges were met by a significant regulatory and economic response. In 1986, for example, the Government of Canada announced \$175 million in funding to overhaul and improve the existing canal system (Niagara Region Development Corporation 1986). The *Shipping Conferences Act*, passed in 1987, sought to further incentivize travel along the canal by exempting certain non-Canadian ships from existing competition laws. A decade later, in 1998, the federal government then passed the *Canada Marine Act*, an extensive piece of legislation aimed at “making the system of Canadian ports competitive, efficient, and commercially oriented” (Government of Canada 1998). The Act, last amended in 2020, prescribes policies for the administration and regulation of ports and waterways in Canada, and was passed “in recognition of the significance of marine transportation to Canada and its contribution to the Canadian economy.” Covering everything from employment on Canadian ships to the rules surrounding ship inspections, the Act provides a standardized list of regulations designed to ensure the smooth operation of marine transportation in Canada. Following the challenges of the 1980s, marine transportation thus found itself the target of supportive policy and intervention.

Though the importance of marine transportation has been recognized within Niagara for some time, this period is also marked by a concerted effort within Niagara Region and its local municipalities to strengthen marine transportation. In 2005, Niagara Region’s official Economic Growth Strategy proposed to “strengthen Niagara’s transportation and distribution services cluster” and build “an effective, multi-modal transportation network for Niagara.” Central to this strategy, the Region argued, would be “the integration of Niagara’s marine, rail, air, and trucking transportation systems at strategic locations.” This period thus saw the Welland Canal play an increasingly important role in Niagara’s multimodal transportation network (Niagara Region 2005). Still, the historical importance of the canal to Niagara’s regional identity remained. “Niagara can steer itself into a more prosperous future,” read the tagline of the 2005 strategy. “The course is charted.”

During this period, Niagara also set its sights on growing and strengthening the manufacturing sector. In 2004, the City of Welland published “A Community Economic Development Strategy for the Way Forward,” listing manufacturing and transportation as local strengths (Welland 2004). Such local efforts to affirm manufacturing’s place in Niagara were strengthened by provincial programs such as Ontario’s *Places to Grow: Growth Plan for the Greater Golden Horseshoe*.



Published in 2006, the program established a Gateway Economic Zone and Gateway Economic Centre within Niagara, creating the foundation for an unfolding strategy seeking to “make employment lands [in Niagara] ... more accretive and accelerate the process of bringing these employment lands to market” (Niagara Region 2012). The resultant *Niagara Gateway Economic Zone and Centre Community Improvement Plan* outlines a series of tax increment-based grant programs designed to stimulate the sustainable development of local employment lands (Niagara Region 2012). In 2013, Niagara Region likewise leveraged the region’s multimodal transportation network and existing logistics ecosystem to strengthen its pitch to prospective industries, attempting to capitalize on emerging growth in advanced manufacturing specifically (Niagara Region 2013). These programs were further supplemented in 2016, when Niagara became Ontario’s first designated Foreign Trade Zone, a designation which offers tax exemptions and other incentives for local exporters (Niagara Economic Development 2022).

The federal government has also continued to be involved. In 2010, the Government of Canada announced its National Shipbuilding Strategy, designed to bolster the shipbuilding industry following the difficulties of the 1980s and 1990s (Government of Canada, n.d.). The impact of these national programs on Niagara’s marine sector is mixed, however. Though marine sector jobs have increased both in Canada and in Ontario over the past two decades (Table 1), Niagara has seen a decline in marine sector jobs over this period.

The decline of marine sector jobs in Niagara has not been constant, however. As Figure 1 indicates, marine-sector jobs in Niagara increased between 2001 and 2008, mirroring similar growth in the province and across the country. Since 2008, however, Niagara’s marine sector has declined despite continued and relatively steady growth both in Ontario and in Canada. This suggests that while federal and provincial programs have bolstered the marine sector within Canada, the benefits of these programs have been muted within Niagara.

Another lens through which we can understand the current state of Niagara’s marine sector is the location quotients (LQs) of jobs in the respective industries that make up the sector. LQ scores indicate an area’s level of specialization in industries, with a score above 1.5 indicating a significant degree of specialization compared to other regions in the country. As Table 2 indicates, Niagara has seen a general decline in competitiveness in almost all its marine occupations over the past two decades.

Despite these broader trends, Niagara’s marine sector continues to be critical to the success of marine transportation both in Ontario and across the country. While the Niagara region does not host any shipbuilders, many local manufacturers continue to specialize in products that are key to the shipbuilding process. The region also hosts businesses that are integral to other parts of the shipbuilding lifecycle, such as the Marine Recycling Corporation in Port Colborne. The company is Ontario’s only year-round shipbreaking yard, breaking down retired ships and sending collected steel to mills across southern Ontario (TVO Today 2023).

Local firms have also capitalized on the shift towards more sustainable and environmentally friendly practices in the marine transportation sector. In nearby Hamilton, for example, the company Thordon Bearings has recently developed a ‘sterntube-less’ ship design that will eliminate the need for oil-lubricated seals and bearings, saving shipowners money while reducing the environmental impact of marine transportation (Thordon Bearings Inc., 2022).

The Future of Marine Transportation in Niagara

Today, the Welland Canal is an integral part of a multimodal trade corridor in Niagara. In 2017, 78 per cent of the St. Lawrence Seaway’s \$34.6 billion in economic activity passed through Niagara on the Welland Canal (Niagara Falls 2020). Popular goods include grain, iron, steel, and dry and liquid bulk cargo (Martin Associates 2023). In 2022, the St. Lawrence Seaway accounted for 14,591 direct jobs in Canada, of which 11,551 were in Ontario (Martin Associates 2023).

Niagara itself hosts more than 640 exporters, with manufacturing continuing to drive exports from the region. In 2021, the sector accounted for 90 per cent of all goods exported from Niagara (Niagara Economic Development n.d.). These manufacturers continue to rely on the Welland Canal for access to traditional and emerging markets, and the Region’s most recent Economic Development Strategy, released in 2022, suggests that the canal will continue to play a pivotal role in drawing manufacturers to Niagara (Niagara Economic Development 2022). For local industry, marine transportation represents an efficient and cost-effective way of getting new products and materials to market, and participating in international supply chains critical to agriculture, mining, manufacturing, and more (Piskur 2018).

Table 1: Change in Marine Sector Jobs, 2001–2022: Niagara, Ontario and Canada Compared

Region	2001 Jobs	2022 Jobs	Change	Percentage change
Niagara	2,191	1,992	(199)	(-9%)
Ontario	91,188	113,285	22,096	24%
Canada	218,217	312,793	94,575	43%

Figure 1: Change in Marine Sector Jobs: Niagara, Ontario and Canada Compared

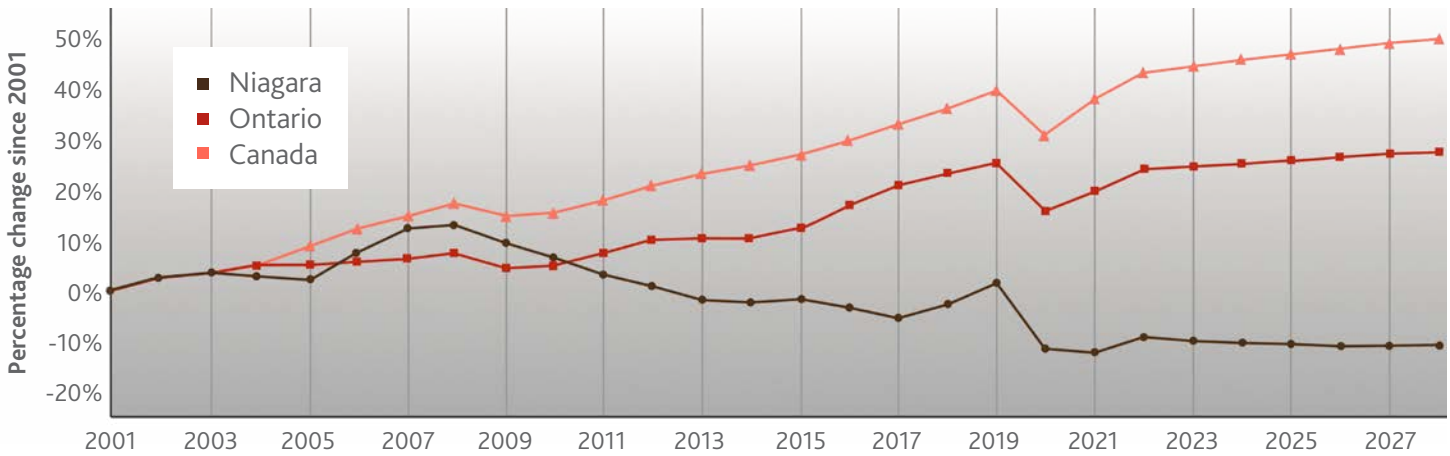


Table 2: Niagara’s National Location Quotient in Marine Jobs, by Occupation, 2001 vs 2022

Industry	2001	2022
Boat and cable ferry operators and related occupations	1.22	1.10
Boat assemblers and inspectors	0.61	0.17
Civil engineering technologists and technicians	0.87	0.69
Civil engineers	0.78	0.71
Contractors and supervisors, electrical trades and telecommunications occupations	0.96	1.07
Deck officers, water transport	0.57	0.49
Electrical and electronics engineering technologists and technicians	0.66	0.47
Electrical and electronics engineers	0.54	0.40
Engineer officers, water transport	1.22	0.88
Industrial engineering and manufacturing technologists and technicians	1.47	0.57
Mechanical engineering technologists and technicians	1.42	0.71
Mechanical engineers	1.10	0.61
Railway traffic controllers and marine traffic regulators	0.75	0.73
Water transport deck and engine room crew	0.59	0.91

*red denotes a location quotient that has declined since 2001

New uncertainties have also created new opportunities, and use of the Seaway is on the upswing. Global conflicts like Russia's war on Ukraine have increased demand for Canadian grain exports, which remain a key commodity on the Seaway (Welland Tribune 2022). This increased demand for Canadian grain has exacerbated trends seen at the beginning of the COVID-19 pandemic, which highlighted the need for more resiliency and redundancy in global supply chains. In 2020, for example, grain shipments through the Seaway were up 27 per cent over 2019 as countries around the world sought to import more Canadian grain (Gedeon 2021). The number of ships passing through the St. Lawrence Seaway has also increased. In 2022, the number of overall vessel transits through the Seaway was higher than in 2021, with major increases in liquid and dry bulk shipments such as potash, salt, and petroleum coke (Welland Tribune 2022). "It's another indication of the vitality of marine shipping on the system linking the Great Lakes to the rest of the world," said Terrence Bowles, president and CEO of the St. Lawrence Seaway Management Corporation (Welland Tribune 2022).

Recent traffic congestion problems—particularly along the QEW—have highlighted the importance of marine transportation to Canada's multimodal transportation infrastructure (Niagara Economic Development 2022). A survey of Niagara firms, for example, finds that highway congestion is the top source of delay within existing supply chains, with one third of firms identifying congestion at the border as the number one reason for delays. (Ferguson 2020). Against this backdrop, marine transportation has emerged as a viable and attractive alternative to conventional transportation methods (Ferguson 2020). Recent efforts to build a multimodal logistics hub in Thorold (Sharma 2023), and investments by upper levels of government in the redevelopment of canal-adjacent lands (Johnson 2023), suggest a growing appreciation for the role marine transportation will play in the future of economic development in Canada.

The recently formed Ontario Marine Council (of which Niagara's Heddle Shipyards is a member) has similarly argued for the continued significance of Ontario's marine sector. The organization's website reads: "In partnership with the Ontario government and industry stakeholders, the Ontario Marine Council will work to ensure Ontario's marine economy realizes its full economic, environmental, and social potential." So far, the organization has focused on supporting the development of a comprehensive marine strategy within Ontario, including investments in training for skilled labour, continued infrastructure improvements, and the expansion of maritime tourism in the province

(Ontario Marine Council, n.d.). With the strategy published in Fall 2023, time will tell whether the benefits of the strategy will be felt within Niagara.

The emergence of the canal as a viable alternative to trucking and rail is particularly important in the context of shifting supply chains for electric vehicles and, most recently, semi-conductors. In the same way that automakers of the 1960s leveraged the canal to expand into new global markets, marine transportation will be critical to strengthening these emerging supply chains and solidifying Canada's place in these global markets. Indeed, while the United States will likely continue to dominate as a destination for Canadian exports, the canal provides important access to new markets around the world (Niagara Development Corridor Partnership Inc. 2018). For example, Singapore, where electrical machinery and equipment constitutes the third largest import, presents an attractive expansion opportunity for Niagara, where electrical machinery and equipment remains the region's largest export (Niagara Development Corridor Partnership Inc. 2018).

In turn, the smooth operation of the canal promises to maintain an innovative ecosystem within Niagara, particularly among local manufacturers directly involved in the marine transportation sector. As mentioned above, this is particularly true as environmental concerns and climate change come to demand innovation within the sector—a demand that Niagara firms are already meeting head on (Welland Tribune 2023). These innovative companies will be particularly important through the continued implementation of Canada's *National Shipbuilding Strategy*, and ongoing efforts to establish a similar marine strategy at the provincial level here in Ontario (Port Colborne 2022). Between 2012 and 2019, for instance, the federal government claims that the *National Shipbuilding Strategy* contributed \$13 billion to GDP and supported an average of 12,000 jobs annually (Government of Canada, n.d.). Recent forecasts also suggest an influx of demand for ship recycling over the next 10 years, as ships built during the early 2000s (a decade where the number of ships globally expanded significantly) are replaced or refitted (Chambers 2023).

To an extent, the potential of the Welland Canal to bolster economic activity in Niagara and in Canada is already on the radar. This is reflected in ongoing efforts at all three levels of government to leverage, support, and improve the operation of the region's marine transportation corridor. In 2021, investments in a new Thorold Industry Hub adjacent to the canal were pitched as the start of a "Niagara Trade Corridor" (Niagara Economic Development 2021). In 2022,

the federal government also leveraged its National Trade Corridor Fund to invest \$22.7 million in the revitalization of Port Colborne Wharves, a \$45.3 million project committed to “the revitalization of industrial lands around the Welland Canal” (Johnson 2023). The project is among many designed to revive local trade capacity and improve the region’s capacity to handle freight. As local Member of Parliament Vance Badawey said of the initiative: “new businesses and new opportunities are being created on once-abandoned lands along the Welland Canal and today our government is taking a bold step in strengthening the Niagara Ports Trade Corridor...” (Niagara Independent 2023). Such programs will continue to prove significant as provincial and federal governments invest more heavily in the development of new green technologies and the solidification of Canada’s role in these emerging global supply chains. The newest federal budget, for example, positions marine transportation and the Welland Canal as key ingredients in the development of a “green corridor” within Canada, representing “the most carbon efficient and cost-effective mode of moving cargo” (Welland Tribune 2023).

For firms already in Niagara, there is room to further leverage marine transportation. Though the value of exports from Niagara has begun to recover following the pandemic (Niagara Economic Development 2023), local firms continue to be more globalized in importing than in exporting, particularly when considering markets beyond

the United States (Ferguson 2020). While manufacturing is still the most internationally balanced between sourcing and revenues, there are concerns that this trade balance is eroding (Niagara Economic Development 2022). Nearly a third of local firms say they do not have exporting relationships with any countries, with only 10 per cent reporting that exporting is a key part of their business “DNA” (Ferguson 2020). This lack of enthusiasm for exporting is worrying given that firms that generate sales outside of Canada are most likely to use modes other than trucking to transport goods (Ferguson 2020). Research also suggests that employment growth rates are higher among Niagara exporters, with exporting also being an indicator of openness to innovation (Ferguson 2020). Marine nevertheless remains the least frequently used method of transportation among local exporters, suggesting capacity for further integration between marine transportation and local firms. Ferguson (2020) notes, for instance, that marine transportation may play a significant role in the expansion of wholesale and value-added exports within the agriculture sector (Ferguson 2020).

Niagara is also beginning to engage marine transportation beyond the day-to-day operations of the canal. This includes the expansion of the cruise ship industry into Port Colborne, which now welcomes ships from companies such as Viking Cruises and Victory Cruise Lines carrying between 180 and 420 guests per vessel (Finucane 2021).

Photo courtesy Niagara Economic Development



Though inflation and rising interest rates have challenged the viability of a proposed Waterfront Centre in Port Colborne, investments in this industry reflect the capacity for marine transportation to help diversify tourism within Niagara (Culic 2023). This is reflected in renewed efforts to reimagine abandoned portions of the canal, as well. From Port Dalhousie in St. Catharines to the City of Welland, old assets are being repurposed in exciting ways for the sake of leisure and sports tourism (Niagara Economic Development 2022; St. Catharines 2017). To that end, the City of St. Catharines has recently launched a “2029 Historic Welland Canals Task Force,” aimed at identifying opportunities for showcasing the first and second canal systems via an expanded trail system (St. Catharines n.d.). These efforts to capitalize on the longstanding spectacle of the canal are a testament to the historic relationship between marine transportation and Niagara, and the global appeal that the uniqueness of the canal continues to have.

There are also efforts to expand marine transportation in ways that are disconnected from the canal. In 2022, for instance, Niagara became home to Hoverlink Ontario Inc., a start-up promising to ferry residents between St. Catharines and Toronto using hovercraft technology (Walter 2023). The company plans to transport up to 180 passengers per trip across the lake, with each trip taking approximately 30 minutes one way. This potential service is an appealing (and more environmentally friendly) alternative to the growing congestion of the QEW and promises to strengthen linkages between Niagara region and the Greater Toronto Area. Diverting traffic from the QEW also promises to improve the effectiveness of existing trade corridors, suggesting marine transportation will play an important role in the evolution of Niagara’s broader transportation network (Walter 2023b).

Conclusion

Marine transportation continues to play an integral role in the economic development of Niagara. Despite difficulties towards the end of the 20th century, the Welland Canal has become a critical node in the transportation corridor. The importance of this corridor will continue to grow as all three levels of government work to strengthen existing supply chains and expand Canada’s role in innovative technology and automotive markets. At the same time, businesses and governments within Niagara are leveraging the region’s marine transportation heritage in new and exciting ways, ranging from sports tourism and leisure trails along the old canal to new commuter hovercraft connections between Niagara and the Greater Toronto Area. As Niagara works to address growing congestion along the QEW, marine transportation is likely to remain a viable and promising alternative.

References

- Chambers, S. (2023). “15,000 Ships to be Scrapped by 2032: BIMCO.” *Splash* 24/7.
- Culic, J. (2023). “Port Colborne Scraps Waterfront Welcome Centre from its Cruise Ship Plans.” *Niagara Falls Review*. <https://bit.ly/3FjFPHk>
- Ferguson, M. (2020). “Exploring Goods Movement and Export Diversification for Niagara Firms.” *McMaster Institute for Transportation and Logistics*. <https://bit.ly/45vVkqy>
- Finucane, D. (2021). “Cruise Ships Set to Sail into Port Colborne.” *InSauga.com*. <https://bit.ly/3FizGew>
- Fraser, D. (2016). “A Spotlight on GM’s Operations in St. Catharines.” *Niagara Falls Review*. <https://bit.ly/45xBaMw>
- Gedeon, J. (2021). “Seaway Grain Trade Bolsters a Pandemic-struck Economy.” *Chamber of Marine Commerce*.
- Government of Canada. (n.d.). *About the National Shipbuilding Strategy*. <https://bit.ly/3Fgag86>
- Government of Canada. (2001). *Canada Shipping Act*. <https://laws-lois.justice.gc.ca/eng/acts/c-10.15/page-1.html>
- Government of Canada. (1998). *Canada Marine Act*. <https://bit.ly/3FetiVP>
- Jackson, J. (1975). *Welland and the Welland Canal: The Welland Canal by-pass*. Mika Publishing.
- Johnson, D. (2023). “\$45.3M Investment in Welland Canal to Revitalize Port Colborne Wharfs.” *Welland Tribune*. <https://bit.ly/46Kxica>
- Larkin, J. (2019). *Overcoming Niagara: Canals, commerce, and tourism in the Niagara-Grate Lakes Borderland Region, 1792–1837*. State University of New York Press.
- Martin Associates. (2023). “Economic Impacts of Maritime Shipping in the Great Lakes-St. Lawrence Region.”
- Niagara Development Corridor Partnership Inc. (2018). “Strategic Plan for the Niagara Free Trade Zone.”
- Niagara Economic Development. (n.d.). “Trade & Export.” <https://niagaracanada.com/data/trade-export>
- Niagara Economic Development. (2021). “Thorold Industry Hub the Start of a Niagara Trade Corridor, Officials Say.” <https://bit.ly/3tAWUdl>
- Niagara Independent. (2023). “Port Colborne Wharves to Undergo Major Revitalization, as Partners Announce \$45.3 Million Project.” *Niagara Independent*. <https://bit.ly/46mFklx>
- Niagara Economic Development. (2022). “Inspire Invest Grow: Niagara’s 10 Year Economic Development Strategy 2022–2032.” <https://bit.ly/3tzjS4A>

- Niagara Economic Development. (2022b). "How Great Lakes Shipping Helps the Niagara Region Stay Afloat." <https://bit.ly/3tzkO96>
- Niagara Falls. (2020). "Community Investment Profile." <https://bit.ly/3tzlhYU>
- Niagara Region. (2013). "Economic Growth Strategy: 2013–2015."
- Niagara Region. (2012). "Niagara Gateway Economic Zone and Centre Community Improvement Plan."
- Niagara Region. (2005). "Navigating our Future: Niagara's Economic Growth Strategy."
- Niagara Region Development Corporation. (1990). "Annual Report of the Niagara Region Development Corporation."
- Niagara Region Development Corporation. (1988). "Niagara Jobs in Jeopardy."
- Niagara Region Development Corporation. (1986). "Annual Report of the Niagara Region Development Corporation."
- Niagara Region Development Corporation. (1985). "Economic Development Strategy."
- Ontario Marine Council. (n.d.). "About Us." OntarioMarineCouncil.com.
- Piskur, M. (2018). "Management of the Great Lakes-St. Lawrence Maritime Transportation System." *Canada-United States Law Journal*, 42(1), 228–264.
- Port Colborne. (2022). "Great Lake Mayors United in Support for Ambitious Ontario Marine Strategy."
- Royal Commission on Pilotage. (1968). *Report of the Royal Commission on Pilotage: General Introduction*. Queen's Printer. <https://bit.ly/3s11iSi>
- Sharma, N. (2023). "HOPA Expands Industrial Inventory at Thorold Port Lands." *Real Estate News Exchange*. <https://bit.ly/3rKx9H5>
- Shiple, R. (1999). "Making a Silk Purse from a Sow's Ear: Lessons from the failure to develop the Welland Canal as a tourism resource." *Environments*, 27(2).
- St. Catharines. (n.d.). "2029 Historic Welland Canals Task Force." <https://bit.ly/3tzBjBH>
- St. Catharines. (2017). "Economic Development Strategy: 2017–2022." <https://bit.ly/3Q0gpDA>
- St. Lawrence Seaway Management Corporation. (2003). "The Welland Canal Section of the St. Lawrence Seaway." <https://bit.ly/3RXzNDS>
- Thordon Bearings Inc. (2022). "ABS-Approved Sterntube-less Ship Concept to Save Shipowners Thousands While Keeping Oceans Clean." <https://bit.ly/3PSMUDP>
- TVO Today. (2023). "Meet the Shipbreakers of the Great Lakes." <https://bit.ly/3S2p6Qq>
- Walter, K. (2023). "Hoverlink Needs More Time to Float Toronto-St. Catharines Rapid Transit." *Toronto Star*. <https://bit.ly/3s0NR4R>
- Walter, K. (2023b). "Hoverlink CEO says cross-lake transit plan OK'd on Niagara side." *St. Catharines Standard*. <https://bit.ly/3RUzrOp>
- Welland Tribune. (2023). "Federal Funding for Green Corridor Will 'Leverage the Unique Strengths' of Marine Industry." *Welland Tribune*. <https://bit.ly/3PUMHQL>
- Welland Tribune. (2022). "Grain Shipments Biggest Mover on Seaway in October." *Welland Tribune*. <https://bit.ly/48VIGnC>
- Welland. (2004). "A Community Economic Development Strategy for the Way Forward."