INTRODUCTION

Much has been published about the reported renewed power rivalry in the Arctic stemming from the impacts of climate change and the melting of sea ice. Highlighted for instance in Scott Borgerson’s papers\(^1\) or Roger Howard’s book\(^2\) about the advent of an era of intense rivalry in the region for the control of resources and shipping routes, the theme blossomed after Russia’s planting of a flag at the North Pole in 2007, the resumption of Russian military patrols in the Arctic, and the competing extended continental shelf claims in the central Arctic Ocean.\(^3\) The possibility that melting sea ice will trigger the fast development of commercial shipping and will thus fuel rivalries for the control of these maritime routes forms part of the picture of this conflict-prone Arctic depicted by the media and several authors,\(^4\) shipping being considered a strategic element in itself or as a tool for the exploitation of natural resources.\(^5\)

The geopolitical dimension of Arctic shipping is several-fold. It includes the status of the current main shipping lanes, the Northwest Passage (NWP) and the Northern Sea Route (NSR), claimed as part of their internal waters\(^6\) or their controlled waters by Canada and Russia, an idea rejected by the United States and several European States. Regionally, it also includes Russia’s strong will to develop the NSR, both as a development to oil for northern Siberia and with a view to fostering a political asset should transit shipping eventually take off. Asian States nurturing interest in Arctic shipping—South Korea, Japan, and China—also participate in the geopolitics of Arctic shipping, their projects being at times interpreted as challenging Russia’s or Canada’s control over their claimed shipping lanes.


\(^{6}\) Internal waters, defined in Article 7 of the United Nations Convention on the Law of the Sea (UNCLOS) (Montego Bay, 10 December 1982, in force 16 November 1994, 1833 *United Nations Treaty Series* 396), are waters over which the State has complete sovereignty, usually on the landward side of the baseline of the territorial sea.
All these aspects boil down to the scope of Arctic shipping—is it expanding, and how?\(^7\) If destinational traffic\(^8\) remains under the control of the port State, transit shipping precisely echoes the conflicting claims of Russia and Canada against the United States’ interpretation of the Arctic passages as international straits.\(^9\) Should Arctic transit shipping develop fast, the risk of witnessing the development of rivalries for its control is much higher than if traffic remains marginal. This article will thus examine the perspectives for the development of transit Arctic shipping: is the geopolitics of Arctic shipping likely to emerge as a major contention point in the region in the short-term future?

THE GEOPOLITICAL ISSUES LINKED WITH ARCTIC SHIPPING

In the geographic school of political geography, geopolitics is about power rivalries over territory, this includes sovereignty, but also use and indirect control.\(^10\) Rivalries about the status of Arctic straits thus fall perfectly into this definition as several States oppose conflicting views about the status of these straits. With the melting of sea ice in the Arctic, accelerating the freeing up of Arctic straits in the summer, improved accessibility for commercial vessels has revived political stakes over the control of these potential maritime routes. These stakes are articulated around four elements that illustrate the extent to which the possible development of Arctic shipping includes a geopolitical dimension.

Sovereignty Issue Over Arctic Straits

Canada and Russia claim sovereignty over Arctic straits, a view challenged by the United States.\(^11\) Canada and Russia also legitimate their supervision of maritime traffic under the provisions of Article 234 of the United Nations Convention on the Law of the Sea.\(^12\) Washington decided not to inflame the dispute with either Ottawa or Moscow given the moderate strategic stakes in the

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\(^8\) Traffic is the generic term referring to shipping activity. It is the sum of voyages, referring to ship movements. In both Canadian and Russian Arctic waters, a voyage tracks the movement of a vessel from its entry into the zone until it exits the zone. A voyage can be destinational—the vessel enters Arctic waters to perform an activity, then exits—or in transit—the vessel merely passing by without stopping at any point nor performing any activity.

\(^9\) As defined in Part III of UNCLOS, n. 6 above, straits used for international navigation. In straits referred to in Article 37, all ships and aircraft enjoy the right of transit passage (art. 38), without the coastal State having the possibility to block this right of transit passage.


absence of significant transit traffic and the fact the American opposition stems from the fear of precedent rather than on a strategic value attached to Arctic straits.\textsuperscript{13}

**Shipping As a Development Tool Under the Control of Russia**

Since the Russian Arctic presently represents between 10 and 20 percent of the Russian economy,\textsuperscript{14} and is largely based on commodities shipped to final markets, to Moscow it is paramount to develop land and sea transportation routes to enable the extraction of natural resources.\textsuperscript{15} Shipping is considered a development tool that is crucial for economic growth, so much so that Russia decided in 2019 that only Russian-made and flagged tankers could participate in Russian oil and gas extraction and transportation.\textsuperscript{16} From a geopolitical point of view, asserting control over Russian Arctic sea lanes is thus crucial, or so it is interpreted by Moscow, for the security of Siberian development.

**Transit Shipping As a Political Tool**

Transit shipping can also be considered as both a source of revenue through collected service fees, and a political tool stemming from the control of a soon-to-be booming artery. It is noteworthy here to underline that whereas Russia has deployed intense efforts to promote shipping along the Northern Sea Route,\textsuperscript{17} Canada has never advertised shipping through the Northwest Passage\textsuperscript{18} and reckons its fee schedule would not be adapted should traffic increase.\textsuperscript{19}

**The Influence of Asian Powers**


\textsuperscript{19} S. Pelletier, Regional Director of the Canadian Coast Guard Programs, pers. comm. (5 June 2015); K. Bartenstein and F. Lasserre, “Canadian Arctic Marine Transportation. Issues, Opportunities and Challenges,” *School of Public Policy Report*, University of Calgary, accepted.

Much has also been written about the interest nurtured by Japan, China, and South Korea about the possibility of participating in the development of new transit shipping routes in the Arctic. If Japan clearly harbingered the soon-to-boom interest in Arctic shipping in Northeast Asia with its participation in the International Northern Sea Route Programme (INSROP, 1993–1999), Chinese and South Korean governments also nurtured a solid interest for the prospect of Arctic transit, a fact reflected in the many papers published by Korean and particularly Chinese scientists on Arctic shipping. Their hopes, however, were largely disappointed as the few shipping companies that ventured into the Arctic transit market withdrew, except the Chinese State-owned enterprise COSCO, and Asian shipping companies display a very moderate interest in Arctic transit shipping, just like European or North American shipping companies. Asian shipping companies, however, are involved in destinational traffic in Siberia and in Canada. MOL (Japan), Cosco and China Merchants are involved in the servicing of gas projects in Russia, while Tata NYK (India/Japan), Thome and ST Shipping (Singapore) and Scorpio (India) are involved in mining projects in Canada. In a general context, where China’s particular interest for the Arctic is perceived by some analysts with suspicion or unease, Russia’s relationship with China is colored with the desire to use Chinese capital to support Siberian development, but also with a fear that China might threaten Russia’s dominion over its Arctic region. As far as shipping is concerned, China appears to have considered participating in the logistics of shipping along the

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24 Destinational traffic consists of vessels going to the Arctic to load or unload, then depart to another destination; it is the opposite of transit traffic, where ships merely pass through Arctic waters without stopping at any port or haven. A legal consequence is that vessels performing destinational service place themselves under the sovereign control of the port State, as opposed to transiting vessels that may pledge the right of transit passage (UNCLOS Article 38), this view being rejected by both Canada and Russia in their Arctic waters.


26 C.D. Wright, The Dragon Eyes the Top of the World: Arctic Policy Debate and Discussion in China, Naval War College, Center for Naval Warfare Studies (Newport, RI: China Maritime Studies Institute, 2011); C.D. Wright, The Panda Bear Readies to Meet the Polar Bear: China Debates and Formulates Foreign Policy towards Arctic Affairs and Canada’s Arctic Sovereignty, Canadian Defence & Foreign Affairs Institute Papers (2011); Lackenbauer et al., n. 21 above; Babin and Lasserre, n. 21 above.

NSR, but Russia is adamant that convoys will remain under firm Russian control and will not be escorted by Chinese icebreakers.

MODELS AND SIMULATIONS KEEP DEPICTING PROFITABLE ARCTIC SHIPPING—BUT WHERE ARE THE SHIPS?

It thus appears the geopolitics of Arctic shipping takes place at different scales and involves different sets of actors depending on the specific issue. The prospect of developing transit Arctic shipping is so pervasive as to trigger a flurry of simulations in the scientific literature, with a view to assessing the profitability of possible commercial transits. One of the authors of this article is regularly asked to evaluate paper proposals. As far as simulations are concerned, a few authors have endeavored to portray the general picture these papers draw. Theocaris et al. and Lasserre have analyzed more than 30 papers trying to simulate the profitability of future Arctic transit shipping. They found that a relative majority of these papers came to the conclusion that Arctic transit is profitable, but also that there is a very significant diversity of methods, parameters, and assumptions. Recently published simulations may still be very enthusiastic about the potential for Arctic transit, like Manta, Sun et al., Sui et al., or several Chinese-led studies about Arctic shipping. However, the picture is now more nuanced with several papers underlining the fact that despite sea ice melt, Arctic transit remains a challenging market from the operational and marketing points of view, with a limited profitability. This should come as no surprise, according

to Gauthier, who concludes that models are often incomplete and fail to take into account the complexity of shipping economics. The discrepancy between the conclusions of several models and the reality of a modest transit traffic is striking, but is better understood when taking into account the shipping companies’ perceptions rather than merely relying on cost models. As underlined by several authors, most shipping companies still perceive Arctic transit as poorly profitable, risky, and too complex from a logistical point of view.

**TRAFFIC GROWTH LARGELY FUELED BY DESTINATIONAL TRAFFIC**

**Traffic is Indeed Expanding**

Traffic has experienced significant growth in the Arctic, both in general and along the Northwest Passage and in the Canadian Arctic. In the Arctic as a whole, the number of single vessels entering the area increased by 25 percent between 2013 and 2019. Statistics indicate that vessel movements are definitely increasing substantially in the Arctic. From 2009 to 2019, traffic multiplied by 1.92 in the Canadian Arctic (Table 1) and by 1.58 between 2016 and 2019 in waters of the Northern Sea Route (Table 2).

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41 PAME (2020), n. 39 above.

42 The Northern Sea Route comprises Russian Arctic waters between the Kara Gate and the Bering Strait. Thus, traffic in the Barents Sea is not included in NSR figures, nor is traffic in Russia’s Arctic Pacific waters.

Table 1.—Vessel movements in the Canadian Arctic, number of voyages, NORDREG zone
Source: figures compiled by the author from data submitted by NORDREG, Iqaluit.

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<td>319</td>
<td>348</td>
<td>302</td>
<td>315</td>
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<td>Fishing boats</td>
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<td>Cargo or barges</td>
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<td>108</td>
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<td>188</td>
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<td>32</td>
<td>34</td>
<td>36</td>
<td>50</td>
<td>48</td>
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<td>25</td>
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<td>33</td>
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<td>53</td>
<td>72</td>
<td>89</td>
<td>106</td>
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<td>33</td>
<td>36</td>
<td>18</td>
<td>23</td>
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<td>10</td>
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<td>6</td>
<td>4</td>
<td>1</td>
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</tbody>
</table>

NORDREG is the vessel traffic system for ships operating in Canadian waters under the Canadian Shipping Act; the Canadian Coast Guard supervises its operation.
Table 2.—Vessel movements in NSR waters, number of voyages

<table>
<thead>
<tr>
<th></th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
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</thead>
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<tr>
<td>Volume transported,</td>
<td>7.265</td>
<td>10.713</td>
<td>20.18</td>
<td>31.53</td>
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<tr>
<td>million metric tons</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voyages in NSR waters</td>
<td>1 705</td>
<td>1 908</td>
<td>2 022</td>
<td>2 694</td>
</tr>
<tr>
<td>Of which:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tanker</td>
<td>477</td>
<td>653</td>
<td>686</td>
<td>799</td>
</tr>
<tr>
<td>LNG tanker</td>
<td>13</td>
<td>225</td>
<td>507</td>
<td></td>
</tr>
<tr>
<td>General cargo</td>
<td>519</td>
<td>515</td>
<td>422</td>
<td>546</td>
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</tbody>
</table>

Bulk

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<tr>
<th></th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
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</thead>
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<tr>
<td>Container</td>
<td>169</td>
<td>156</td>
<td>150</td>
<td>171</td>
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<tr>
<td>Icebreaker</td>
<td>58</td>
<td>101</td>
<td>232</td>
<td>231</td>
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<tr>
<td>Supply</td>
<td>57</td>
<td>104</td>
<td>169</td>
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<tr>
<td>Research</td>
<td>91</td>
<td>87</td>
<td>85</td>
<td>93</td>
</tr>
</tbody>
</table>

Source: adapted from the Center for High North Logistics (CHNL); the Northern Sea Route Administration does not publicly publish traffic data, rather it communicates the information to CHNL for online publication.

Contrasting trends can be observed within the general and substantial increase in vessel traffic in these two areas. The year 2020 was an anomaly because of the impacts of the COVID-19 pandemic, which affected mining or triggered a ban on cruise shipping in Canada, for instance.

In the Canadian Arctic, growth in traffic was mainly driven by fishing vessels (+106.2 percent between 2009 and 2019) and cargo ships (+122 percent), of which dry bulk experienced the fastest expansion (+288.9 percent), driven by mining activities, and general cargo (+156.5 percent), driven by community supply. Bulk traffic has benefited from the exploitation of Arctic and subarctic mines, such as Voisey’s Bay (Labrador), Raglan and Canadian Royalties/Jilin Jien (Quebec), and Mary River (Baffin Island, Nunavut). This expanding traffic has largely compensated for the dwindling traffic to and from Churchill since the port closed down in 2016 before reopening in 2019 (there were only four voyages of grain-carrying bulk vessels in 2019 and three in 2020). For instance, Baffinland Iron Mines shipped 920,000 tons of ore from its mine in Mary River through its port of Milne Inlet in the first year of activity in 2015, then 4.1 million tons in 2017 and 5.1 million tons in 2018. The company intends to eventually reach an annual

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volume of 12 million tons. Other active gold mines north of Rankin Inlet also generate traffic related to the logistics of mining operations. In the Canadian Archipelago, Fednav operates strong Polar Class vessels (Arctic, Umiak, Nunavik, and Arvik) capable of navigating in winter, servicing the two Deception Bay mines in northern Quebec. The company may develop a business model in partnership with mining companies for year-round shipping to Deception Bay and Milne Inlet (operational ports), as well as Steensby Inlet (projected). The logistics of mining activities are dominant in terms of tonnage in the Canadian Arctic: the capacity of bulk carriers servicing mines (measured in cumulated vessel deadweight tonnage (dwt)), at 6.1 megatonnes (Mt), which accounted for 77.3 percent of the tonnage capacity of traffic in the Canadian Arctic in 2020.47

Large, powerful dry bulk carriers transport ore from the maritime terminal built to service the mine; the construction of deep-water docks is required for base-metal mines that ship large quantities of ore.

In Russia, tanker traffic increased 67.5 percent between 2016 and 2019. LNG tanker traffic went from nil to 507 voyages, and icebreaker voyages increased 238 percent. Tanker traffic experienced a sustained growth with the oil and gas developments in the Barents Sea (Prirazlomoye oil field and Varandey oil terminal)48 and on the Yamal Peninsula and Ob Bay, with the Sabetta and Arctic Gate terminals serving Yamal LNG and the Novy Port oil project respectively, and the impending opening up of an Arctic LNG 2 terminal.49 With the programmed opening of coal, lead and zinc mines, and more ore shipments from the port of Murmansk, bulk traffic should experience fast growth in the Russian Arctic as well.50 Fishing, which is concentrated in the Barents and Bering Seas, does not appear in these statistics.

It is apparent that the main driver for the expansion of shipping in the three areas is natural resource exploitation, including mining, oil and gas, and fishing. Community resupply in Canadian waters and cruise ship traffic in Greenland also have experienced sustained growth. However, contrary to popular belief and widespread expectations, transit traffic remains very limited along Arctic passages in Canada and Russia.

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46 Polar Class (PC) refers to the ice class assigned to a ship by a classification society based on the Unified Requirements for Polar Class Ships developed by the International Association of Classification Societies (IACS) published in 2011.

47 Bartenstein and Lasserre, n. 19 above.


50 Nickel ore is shipped in containers from the port of Dudinka, thus the apparently high container traffic in fact largely reflects shipments of mineral and metallurgical semi-transformed products, besides limited reefer shipments of fish from Kamchatka to Arkhangelsk and St. Petersburg.
Transit Traffic Remains Weak

Despite the ongoing melting of sea ice, transit traffic remains rather limited along the Northwest Passage and the Northern Sea Route, here again with differentiated pictures (Tables 3 and 4) 51

In both cases, there is a definite trend towards an expansion in transit traffic, but with differentiated histories and composition. Transit numbers across the Northwest Passage were higher at the beginning of the period, experienced growth until 2012, witnessed a moderate decline, expanded again until 2017, then collapsed in 2018, only to recover in 2019. Transit in the NWP is largely composed of pleasure boats as compared to between zero and two commercial vessels. This may be about to change: three transits were performed by cargo vessels in 2019 and five in 2020. Vessels from the Dutch shipping company Royal Wagenborg accounted for two of the transits in 2019 and all five in 2020. The company openly advertises the voyages 52 hinting it may attempt to develop this market in the future. As far as cargo vessels are concerned, tankers and bulkers were prevalent among the few transits before 2017; now general cargo vessels dominate.

51 A methodologic note is necessary here. The term transit is interpreted differently by the various administrations that collect and publish figures describing transit along Arctic passages. In Canada, figures are collected by the Canadian Coast Guard section responsible for the enforcement of the Northern Canada Vessel Traffic Services Zone Regulations (NORDREG). The definition used by NORDREG for transit is a movement between Baffin Bay to the Beaufort Sea. Robert Headland and his team at the Scott Polar Research Institute (SPRI) use a definition whereby transits are counted between the Labrador Sea and Bering Strait (See R. Headland and SPRI, “Transits of the Northwest Passage to End of the 2019 Navigation Season,” Scott Polar Research Institute (Cambridge, 2019), available online: <https://www.sprri.cam.ac.uk/resources/infosheets/northwestpassage.pdf>.) This difference does impact figures since a vessel servicing the community of Inuvik from Montreal will be counted as a transit by NORDREG but not by the Scott Polar Research Institute. This is why the SPRI counts 32 transits in 2017 (33 for NORDREG), and 3 in 2018 (5 for NORDREG) for instance. In Russia, figures are collected by the Northern Sea Route Administration, then formatted and published by the Center for High North Logistics (CHNL), a private association and therefore not an official Russian administration. CHNL bases its figures on the NSRA definition of transit, which is a voyage between the Bering Strait and the Kara Gate. Thus, a ship from Kamchatka to Murmansk will be counted as a transit by CHNL despite the fact the ship is still in Russian Arctic waters. Other voyages, like those by heavy lift vessels Beluga Foresight and Beluga Fraternity in 2009 are counted as transits by CHNL from South Korea despite the fact they unloaded their cargo at Yamburg before proceeding to Germany, thus making their movements destination voyages. On these methodological issues, see F. Lasserre and O. Alexeeva, “Analysis of maritime transit trends in the Arctic passages,” in International Law and Politics of the Arctic Ocean: Essays in Honour of Donat Pharand, eds., S. Lalonde and T. McDorman (Leiden: Brill Academic, 2015), pp. 180–193; F. Lasserre et al., “Compared transit traffic analysis along the NSR and the NWP,” in Arctic Shipping: Climate Change, Commercial Traffic and Port Development, eds., F. Lasserre and O. Faury (London, Routledge, 2019), pp. 71–93. We worked here with official NORDREG figures and semi-official CHNL figures.

Table 3.—Transit traffic along the Northwest Passage, 2006–2020

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<tbody>
<tr>
<td>Icebreaker</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>3</td>
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<td>1</td>
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<tr>
<td>Cruise</td>
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<td>4</td>
<td>2</td>
<td>2</td>
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<td>3</td>
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<td>Pleasure boat</td>
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Source: figures compiled by the authors from data submitted by NORDREG, Iqaluit

### Table 4.—Transit traffic along the NSR, 2006–2020

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<td><strong>Total official transit</strong></td>
<td>0</td>
<td>3</td>
<td>13</td>
<td>41</td>
<td>46</td>
<td>71</td>
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<td>27</td>
<td>27</td>
<td>37</td>
<td>64</td>
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<tr>
<td>Volume transported, million metric tons</td>
<td>0.11</td>
<td>0.82</td>
<td>1.26</td>
<td>1.18</td>
<td>0.27</td>
<td>0.04</td>
<td>0.21</td>
<td>0.19</td>
<td>0.490</td>
<td>0.697</td>
<td>1.281</td>
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<tr>
<td>Total volume handled in the NSR, million metric tons</td>
<td>2.219</td>
<td>2.085</td>
<td>3.225</td>
<td>3.75</td>
<td>3.914</td>
<td>3.982</td>
<td>5.432</td>
<td>7.265</td>
<td>10.73</td>
<td>20.18</td>
<td>31.53</td>
<td>33</td>
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Source: CHNL data (https://arctic-lio.com/), compiled and adapted by authors

Statistics show that both in terms of voyages and tonnage, transit represents a very small share of total traffic along the NSR, despite the increase in tonnage since 2018 as transit tonnage increased to 1.2 Mt in 2020. In transit traffic along the NSR, cargo vessels are more diversified than in the NWP. Between 2010 and 2014, tankers dominated transits, then general cargo vessels became dominant since 2015. Bulkers were a significant share of vessels in 2012, 2013 and again in 2020. As far as tonnage is concerned, bulkers represented the largest component of transit in 2020, with 1.004 Mt of iron ore from Murmansk (78.4 percent), and were largely responsible for the fast expansion of transit that year, whereas in 2019, crude oil represented 43.3 percent of transiting cargo and iron ore 21.5 percent. It is noteworthy to underline that these shipments of iron ore from Murmansk represent movement from an Arctic port and thus should rather be considered as Arctic destinational traffic, a methodological point evoked above.

Transit traffic along the NSR was initially very modest, then expanded to a high of 71 voyages in 2012, then collapsed to 18 in 2014, and recovered gradually to 37 in 2019 and 64 in 2020. It may be that the increase is an ongoing process, but that does not hide the fact that transit traffic remains modest, especially when compared to destinational traffic along the NSR, and when compared to transit traffic along major straits or canals like Malacca, Suez or Panama.53

The composition of this traffic differs depending on the region. Commercial cargo ships represent the largest share of transit traffic along the NSR, whereas transit along the NWP is largely composed of pleasure boats, with commercial vessels comprising between zero and two units (except for five in 2019). Among the elements that explain this very weak interest for transit traffic along the NWP, let us mention a higher ice concentration in summer,54 the absence of promotion of the NWP as opposed to a very proactive stance in Russia, and a higher level of equipment and infrastructure along the NSR, including ports that can harbor ships in case of damage. Icebreaker support also varies greatly, with Canada having only nine Arctic-capable icebreakers as opposed to Russia’s five nuclear and 38 diesel icebreakers.

This comparison between total and transit traffic underlines the fact that destinational traffic (ships going to the Arctic, stopping there to perform an economic task and then sailing back) remains the driving force in Arctic shipping. This destinational traffic is fueled by the servicing of local communities, the exploration for natural resources and their exploitation, including mining, oil and gas, and fishing. Natural resource extraction is by far the strongest driver in Arctic shipping, whether in the Russian Arctic or the Canadian Arctic, but less so in Greenlandic waters since oil and gas extraction have become less attractive commercially.55 The results are therefore mixed for 2020. While some oil and gas discoveries are rather promising in Alaska, Canada and Russia, the large-scale development and operation of these projects remains uncertain, despite Russia’s willingness to push for the rapid expansion of extraction. First, operating costs are high, but the industry also remains very sensitive to world prices.56 The high volatility that has marked this year,

53 Lasserre and Têtu, n. 15 above.
54 “Climate Change in the Arctic,” National Snow and Ice Data Center (NSIDC) (2021), available online: <https://nsidc.org/cryosphere/arctic-meteorology/climate_change.html>.

between the pandemic and price war, has had a definite impact on current projects, and it remains to be seen what the impact will be in the long term.

THE PROSPECTS FOR THE ADVENT OF MAJOR SEAWAYS ARE MODERATE

The low level of transit traffic level is clearly out of step with media forecasts announcing the advent of heavy traffic along Arctic routes. This is due to several factors, some of them short-term and specific to the NSR.\(^{57}\)

- The decline in commodity prices, which makes Arctic resources less attractive, both for exploitation and for initial investment for transport with specialized vessels. The impact of this element may decrease as new oil, gas, and mining sites open along Siberia’s Arctic shore, but moderate commodity prices also hinder the opening up of new extraction sites. The market fluctuates, but the general low price levels of recent years and pressure towards energy transition have discouraged several investors.\(^{58}\)
- The decline in both bulk and container freight rates and volatility despite their rebound in 2021,\(^{59}\) which discouraged shipping companies facing overcapacity from investing in new ice-strengthened vessels.
- The priority deployment of Russian icebreakers to infrastructure projects, notably the terminals linked to the oil and gas project on the Yamal Peninsula or the Ob River delta. The limited availability of icebreakers for transit convoys, despite sustained Russian efforts to build and launch new icebreakers, has dissuaded some carriers from hiring vessels due to lack of guaranteed escort.
- A confusing tariff schedule for the services of the Northern Sea Route, which is considered opaque by some maritime carriers.

More generally, prospects for a boom in transit shipping along Arctic routes are moderate, given the generally poor perception of the opportunities for this market among shipping companies.\(^{60}\)

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\(^{57}\) S. Balmasov, Head of the NSR Information Office, Murmansk, pers. comm. (25 November 2016); Doyon et al., n. 20 above.

\(^{58}\) Lasserre and Pic, n. 55 above; Lasserre (2021), n. 56 above.

\(^{59}\) “Why freight rates are high right now and how shippers can adapt?,” Hellenic Shipping News (April 5, 2021), available online: <https://www.hellenicshippingnews.com/why-freight-rates-are-high-right-now-and-how-shippers-can-adapt/>.


• Containerized goods are transported in a liner shipping mode, that is, ship movements are scheduled with timetables published six months ahead. Container shipping companies do not merely sell the transportation of goods, but also guarantee on-time delivery according to these fixed schedules. Drifting ice, an increasing number of icebergs and thick fog banks, however, make it difficult to meet these tight schedules and to plan, six months ahead, the ice conditions that will prevail in summer in the chokepoints the vessels must cross. Drifting ice can temporarily block some straits, making them very tricky to navigate, which could cause delays in delivery or perhaps even force the ship to turn around and transit by the Panama Canal, resulting in disastrous delays both in terms of financial penalties and reduced credibility.61

• On the contrary, bulk transportation is structured along a tramp mode: there are no schedules but vessels ply the seas on an ad hoc basis, depending on the contracts their company can garner. This means that, unless management signed a long-term contract, there is no guarantee a bulk vessel will navigate Arctic waters. However, in order to do so, the company must invest in crew training, ice-classed vessels, and more expensive insurance plans, expenses that may prove useless if the vessel is used in warmer seas. This is also a major disincentive for bulk shipping companies.62

• The decline in oil and fuel prices, which makes the search for possible reductions in transit costs less attractive for shipping companies. Savings on fuel costs run high among the positive elements attached to Arctic shipping routes, according to surveyed shipping companies,63 but this reported advantage decreases with moderate bunker costs. Since 2018, bunker costs have undergone a strong decline and have not yet recovered since prices peaked above US$650/ton in 2011 and remained above US$600 until 2014 Q464 or US$513/ton on November 15, 2018.65 The potential cost advantage of Arctic routes will be even more questioned when the IMO ban on heavy fuels is enforced, between 2024 and 2029. In February 2020, the IMO drafted a regulation that bans heavy fuel oil (HFO), the cheapest but also dirtiest bunker fuel used by ships. The regulation, formally adopted in June 2021, enables Arctic States to waive the ban for ships flying their own flag while traveling in their domestic waters until July 1, 2029, a crucial concession in order to secure Russia’s support.66 Despite NGOs’ protests to the effect that the ban is reportedly too weak,67 it nevertheless means ships plying Arctic waters will eventually need to use more expensive fuels while vessels of classical routes can still burn HFO, squeezing yet further the debated profitability of the Arctic routes.

61 Lasserre and Pelletier, n. 7 above; Lasserre et al. (2016), n. 20 above.
62 Doyon et al, n. 20 above; Lasserre et al. (2016), n. 20 above.
63 Lasserre and Pelletier, n. 7 above; Beveridge et al., n. 23 above; Lasserre et al. (2016), n. 20 above.
The IMO-enforced ban on HFO comes in the context of gradually building up pressure on shipping companies to pledge against Arctic shipping. Although this movement remains far short of boasting dozens of shipping companies, the Arctic Corporate Shipping Pledge launched by the NGO Ocean Conservancy managed to enlist famous corporate names such as manufacturers Nike, Puma, Ralph Lauren, GAP; forwarders Kuehne & Nagel, EV Cargo, Hillebrand; and shipping companies Hapag-Lloyd, CMA-CGM, MSC and Evergreen. Indeed, these shipping companies are all in the container market that is definitely not attracted by Arctic shipping according to industry surveys: their pledge is thus a low-cost withdrawal but with a high public relations added value. Arctic marine transportation is no longer merely a matter of costs or corporate strategy, as it is now included in the global debate about climate change and hesitant companies may feel reluctant to engage in activities that could reward them a bad corporate citizen label.

Transit shipping is much more politically sensitive in the Arctic as it echoes the debate about Russian and Canadian claimed sovereignty over Arctic passages, whereas nobody questions the fact destination traffic is under the control of the coastal State. In the frame of a geopolitical analysis, transit is thus much more at stake. However, the transit shipping market is not about to experience the long-heralded boom. Operational constraints (drifting ice, pressure ridges, intense cold, and distance) remain significant despite climate change, and the shipping industry perceives Arctic shipping will remain a niche market, small and difficult to enter unless very specific opportunities arise.

A GAME CHANGER? THE ADVENT OF THE ARCTIC HUB BUSINESS MODEL

In response to the operational, technical and commercial problems inherent to navigation through Arctic passages that constrain a large number of shipowners, a new business model seems to have emerged in the region based on possible projects for Arctic and subarctic transhipment hub ports in Russia, Europe, North America and Northeast Asia. More specifically, this involves developing intersection transhipment hubs, accessible by all types of vessels. In this model a company with ships that do not have the qualifications to navigate in Arctic waters, or that does not wish to invest in ensuring that its fleet or crew comply with the standards of the Polar Code and Russia or Canada, could take its cargo to the transhipment hub at one end of the NSR or the

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NWP. There, the goods would be transhipped onto a larger vessel that would be designed to sail year-round in these Arctic passages.\textsuperscript{72} Another transhipment hub at the opposite end of the passages, in ice-free water, would allow the goods to be transhipped again onto yet another vessel that the shipowner would again have agreed to divert north, and then to be delivered to their final destination.\textsuperscript{73}

If certain Nordic and Asian States welcome these transhipment hub projects, believing that these ports will revitalize the economy and navigation in the NSR or NWP, there are uncertainties as to the benefits that would be made by using this model. Costs would still be incurred with the two transhipments and the shuttle service between the two ends of the Arctic routes, which would use ships with more advanced technologies as well as a crew and a pilot specially trained for the conditions encountered in the Arctic.\textsuperscript{74} In order to offer a competitive service that attracts shipping companies, the benefits must outweigh the costs of using such a business model. Transhipment hubs must therefore meet criteria such as being accessible with only a small deviation from the main maritime routes, having a sufficient draft to harbor the large vessels that now ply the main shipping routes, and having effective infrastructure to efficiently handle transhipped cargo.\textsuperscript{75}

For Russia, transhipment is already used in natural resources transportation, mostly from oil terminals in Varandey and Prirazlomnoe to Murmansk, and to a more limited extent for liquefied natural gas (LNG) from the Yamal Peninsula.\textsuperscript{76} The economic rationale for the development of transhipment hubs differs for the transportation of LNG and for containerized goods. For LNG, a more cost-effective model emerged with transhipment hubs. This stems from the fact that LNG transport is increasingly carried out with high ice-class (PC4) vessels, which are both heavy and costly and can navigate nearly year-round in Arctic waters, but are clumsy and much less cost-effective in open waters.\textsuperscript{77} It makes more sense to have them offload their cargo in transhipment


\textsuperscript{73} Milaković et al., n. 71 above.

\textsuperscript{74} Id.


\textsuperscript{76} Agarcov et al., n. 48 above.

hubs and enable them to carry more gas between the production site and the transhipment hubs, most likely in Murmansk and Petropavlovsk-Kamchatsky. As for general or container cargo, the idea is to circumvent the reluctance of shipping companies for transit of these passages through the development of transhipment terminals at locations such as Murmansk, Arkhangelsk, Indiga and Zarubino, where regular container vessels would offload part of their cargo for it to be loaded onto Arctic shuttle ships. For this type of hub, proximity to the main shipping lanes is crucial because shipping companies may not want to engage in a significant deviation for a limited volume of cargo. By contrast, for bulk vessels in the case of commodities, that issue is much less relevant since vessels accepting a loading contract do not work on a liner basis and are more likely to accept travelling all the way, possibly on ballast, to reach the loading port or terminal. Certain port projects, specifically those of Arkhangelsk and Zarubino, have captured the attention of China, which is increasingly interested in the idea of an intersection hub for the transportation of raw materials or goods, and asserts its interest in investing in the construction of port infrastructure. Further, Russia seems eager to invest in promotion of transit operations in the NSR with the development of shuttle services between two Russian transhipment hubs, Murmansk and a location in Kamchatka.

However, despite the port development in northern and eastern Russia, the intersection-type transshipment that is targeted by the new business model is only at the preliminary and exploratory stage, with few tests carried out. Further, it has to be noted that most of the ice-free ports in Russia have limited depths to accommodate vessels of considerable size, or are far from the main shipping routes. Taking into account these challenges regarding hub projects in Russia, certain European and Northeast Asian ports become interesting, in particular the potential hubs at Finnfjord in Iceland, Kirkenes in Norway, Tomakomai in Japan and Busan in South Korea, each of which meet several transhipment hub criteria. The project at Finnfjord, for instance, provides

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79 O. Faury et al., “Analysis of Murmansk as a gateway for the Arctic production,” 27th Annual IAMé Conference (2019), Athens, Greece; S. Kokin, “Архангельск порт – северные ворота в Арктику” [The port of Arkhangelsk is the northern gateway to the Arctic], The Arctic (September 21, 2018), available online: <https://arctic.ru/analtic/20180921/791100.html>.


good draft in an ice-free port year around, in addition to providing low-cost power. Some of the routes proposed by the Icelandic engineering company EFLA would pass through the Transpolar Sea Route from Finnafjord to Alaska, for example, representing a distance of 5,800 nautical miles. However, this passage remains uncertain, seasonal and would not necessarily be desirable due to the impact on the environment and Arctic ecosystems.

For the Asian hub projects, unlike the majority of Russian and European transhipment hubs, their motivation relies especially on a more efficient and shorter transit of goods to international markets than along the traditional routes of the Suez or Panama Canals. Regarding transhipment hub projects in the United States and Canada, such as Portland, Maine or Halifax, Nova Scotia, some experts doubt the idea of transhipment would attract shipping companies to the NWP. Overall, there is a lack of realistic potential transhipment hubs in those countries, apart from a few in Alaska in the United States, and Nova Scotia and Newfoundland and Labrador in Canada. Ultimately, few transhipment hub projects could be viable and credible for intersection transhipment, since the majority rely on the export of raw materials from the Arctic in volumes that, despite their likely increase, may not warrant the development of several transhipment ports dedicated to oil, gas or minerals. The model of a transhipment hub to transit goods through Arctic routes is not well developed for the moment, which is reflected by the lack of scientific literature on the subject, and may explain the preliminary and exploratory stage of most projects, especially in Europe and in North America.

The poor commercial perspectives of transit shipping and the higher efficiency of transhipment hubs for the transport of natural resources gave rise to a new business model: the possibility of supporting the expansion of transit shipping through the construction of transhipment terminals exploited by dedicated shuttle companies. It remains to be seen if this model, already emerging for oil and LNG in Russia, could reach profitability for general transit of goods between the Atlantic and the Pacific. In the meantime, this emerging new business model has led to a new kind of geopolitical rivalry, as would-be hubs in North America, Europe and Asia advertise the advantages attached to their location and vie for the interest of investors and shipping companies.

CONCLUSION

The onset of sea ice melting triggered by climate change has renewed the interest of governments and analysts in the potentially shorter Arctic seaways. Should these routes witness sustained traffic


between the Pacific and the Atlantic, their control could become a strategic issue. The geopolitical dimensions of Arctic shipping revolve around the support of shipping as a development tool and the control of Arctic straits and Arctic shipping: are Arctic straits under the sovereignty of Canada or Russia? Could non-Arctic States participate in shipping control, such as escorting convoys? Could transhipment hubs emerge and if so, where would they be located?

However, most elements of geopolitics connected with Arctic shipping are unlikely to lead to major tensions without the development of significant transit traffic. The interactions between States about control over Arctic shipping and the Arctic straits has remained moderate: no State chose a confrontational posture, except Washington for a very limited period in 2019, because the stakes are limited given the scant development of transit shipping and its poor prospects in the future. The United States and the European Union’s opposition to Canada’s and Russia’s positions are well-known, but this has not developed into direct confrontation. Similarly, Asian States like Japan, China or South Korea have expressed interest in Arctic shipping, but their position regarding the status of Arctic straits remains blurred. So far China has respected Russia’s and Canada’s demand that transiting ships ask for permission for their icebreakers and commercial vessels. Russia, however, has vocally asserted its control over the NSR as it became a strategic development tool for its Arctic region.

Since traffic remains moderate, like shipping companies’ interest, tension has not escalated because of Arctic shipping, albeit there are disagreements regarding the status of the Canadian and Russian straits. Apart from Russia’s domestic use of the NSR as a leverage for its economic development, so long as transit shipping remains weak, there is no incentive for States to get into a confrontational stance with their neighbors over the control of Arctic shipping. Arctic shipping is largely fueled by destinational traffic and thus under the control of the port State. In the coming decades, shuttle transit shipping, whether across Arctic straits or directly across the Arctic Ocean (transpolar route) could alter this situation and provide for the expansion of transit shipping, but this remains a hypothesis for the time being. Placement of transshipment hubs might trigger a renewal of disputes over Arctic straits and geoeconomic rivalries.

**Abstract for Scopus Indexing:**
With the impact of climate change and the melting of sea ice, many narratives about the impending boom in Arctic transit shipping have emerged. Analyses also highlight the potential conflicts between Russia and Canada, on the one hand, claiming sovereignty over their respective Arctic passage, and the United States, the European Union and possibly Asian States, on the other hand, asserting to various degrees the international straits status for these Arctic passages. These geopolitical conflicts for the control of transit shipping and the Arctic straits have not taken place because of a very limited traffic volume stemming for the limited attraction of these Arctic routes for transit. Traffic is indeed expanding, but it is destinational traffic, under the firm control of the port State. The possible development of transshipment hubs for Arctic shipping could change this picture.

**Keywords for Scopus Indexing:** Arctic shipping, geopolitics, bulk, container, sea ice, logistics, port hub, international straits