

**Kate
Todd**



**Naval
Association
of Canada**

The Future is Uncrewed

**The Multi-Mission Corvette Project
Visions & Options Series**

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The Future of the Corvette Project Should be Uncrewed

Kate E. Todd | March 2025

This Naval Association of Canada series is devoted to examining options for Canada's Multi-Mission Corvette Project. Support for this work is provided by the Canadian Maritime Security Network

Executive Summary

The Royal Canadian Navy's (RCN) *Kingston*-class Maritime Coastal Defence Vessels are at the end of their lifespan and must be replaced. In 2023, the Navy stood up the Canadian Multi-mission Corvette Project to determine what should replace them. This paper offers a vision of what the Navy could procure. It argues that the *Kingston* class should be replaced with upwards of twenty-four optionally crewed autonomous multi-mission vessels that are more heavily armed than their predecessors. By doing so, Canada could leverage the new technology that is revolutionizing naval warfare and prepare itself for whatever situations the RCN may find itself in in the future.

Background

Canada's *Kingston*-class Maritime Coastal Defence Vessels (MCDVs) have served as the RCN's workhorses for almost thirty years. These twelve minor war vessels were built in the early to mid-1990s and launched shortly thereafter, between 1995 and 1998. They displace approximately 970 tonnes when fully loaded, measure 55.3 metres long by 11.3 metres wide with a 3.4-metre draught,¹ and carry a crew of up to forty-seven sailors. The MCDVs were designed as inexpensive, lightly armed, multi-purpose ships, with the ability to tow arrays and embark mission-specific payloads in the form of twenty-foot sea cans. They have been used for a variety of missions, including coastal patrols, minesweeping, anti-drug and anti-piracy operations, surveillance, law enforcement, and search and rescue, as well as several named domestic and international operations such as *Operation Caribe*, *Operation Projection*, and *Operation Nanook*. However, they have now reached their expected twenty-five- to thirty-year lifespan and are due to be retired.

Context

In 2023, the RCN stood up the Canadian Multi-mission Corvette (CMC) Project to identify the vessels that will replace the MCDVs.² Officials have not shared details of the project publicly, aside from indicating that it is underway. According to the Commander of the RCN, Vice-Admiral Topshee, the Navy is looking to replace the *Kingston* class with a combat-capable multi-mission corvette or frigate that can work alongside the RCN's future River-class Canadian Surface Combatants.³ In terms of armament, the Vice-Admiral has emphasized the need for the new vessels to be warships and has expressed interest in kitting them with weaponry such as vertical-launch missile systems. This emphasis on procuring warships, rather than vessels fit for peacetime duties, reflects the new reality in which the Navy finds itself.

Over the past decade, the international security environment has degraded,⁴ while developments in technology have revolutionized naval warfare. There has been a rise in the number of threat actors, a return to great power competition, and a proliferation of advanced artificial intelligence (AI) and weapons technology, including in autonomous vessels, hypersonics, and submarines. In response to these changes, Canada's allies and adversaries are investing heavily in their militaries and are adopting autonomous vessels and vehicles.⁵ Autonomous vessels and vehicles use AI, to varying degrees, to operate without the need for a human crew. Optionally crewed vessels are a type of autonomous vessel that can operate with or without sailors aboard. By adopting autonomous vessels, navies reduce risk to human life, operator errors, as well as the cost of naval operations, while complicating enemy targeting, improving reaction times, and creating the opportunity to engage in distributed maritime operations.⁶ Utilizing such operations increases a Navy's lethality and survivability against adversaries, particularly those deemed to be peer or near-peer. When selecting a replacement for the MCDVs, the RCN must account for these developments.

Considerations

The RCN should consider replacing the *Kingston* class with optionally crewed vessels. The Navy is facing a personnel crisis, with approximately 20 percent of positions across the fleet remaining vacant.⁷ Reflecting this, Canada should procure ships that require less personnel to crew them. By embracing autonomous options, the RCN can reduce its demand for sailors while improving its capabilities. If the RCN were to procure enough autonomous vessels, it could also engage in distributed maritime operations that would greatly improve the fleet's lethality and survivability. This new class of ship should also be larger and more heavily armed than the MCDVs, like a frigate or corvette, allowing them to carry more equipment, be more versatile, and be combat ready, if need be.

As Vice-Admiral Topshee said, these new ships need to be warships that are able to defend themselves. Ideally, the ships should weigh between 2,500 and 3,500 tonnes and measure approximately 130 metres in length, 15 metres at the beam, and 6 metres in draught. This size of vessel would be classed as a large corvette or small frigate. The ships should be armed with both surface-to-surface and surface-to-air missiles, as well as torpedoes for anti-submarine warfare. Along with these systems, the ships should have counter-drone and gun systems. With these characteristics, the ships would be equipped to defend themselves and allies against whatever threats may come their way.

Additionally, the new class must have agile and adaptable navigation, communication, sensor, electronic warfare, and combat systems. Top-of-the-line AI-enabled navigation, sensor, electronic warfare, and combat systems, tactical data links, and cyber security measures should be installed. Due to the speed of technological advancements, the ships' systems should be able to be easily updated and upgraded to ensure that they do not become outdated. It is also important that they be interoperable with the systems aboard Canada's forthcoming River-class Canadian Surface Combatants, as well as those of allied vessels.

In the new security environment, RCN ships are unlikely to work alone. Therefore, it is imperative that they seamlessly integrate into Canada's fleet and can work alongside Five Eyes and NATO allies. When selecting systems for the new class, special focus should be given to procuring systems already in use by allies or that can easily work alongside allies' systems. This way, the new ships would be able to contribute to larger defence efforts.

Overall, the ships need to be able to be globally deployable and deliver multiple effects. Not only should the new class be able to participate in littoral combat and coastal defence, but they also require capabilities for mine-hunting, anti-submarine warfare, and joint operations. As such, the class should have multiple missile and gunnery systems, as well as a hangar to house helicopters and drones. Like the MCDVs, the ships should also be able to carry sea cans for different mission sets. In short, these ships must be multi-purpose warships, capable of standing on their own and fulfilling a variety of missions, wherever they are sent.

Proposed Solution

The RCN should replace the MCDVs with large, well-armed, optionally crewed vessels, with state-of-the-art, interoperable systems. By procuring a corvette or frigate-sized warship, the Navy would be able to pack more capabilities on each vessel, making the class more versatile than the MCDVs. Arming these larger ships with anti-ship, anti-air, anti-submarine, counter-drone, and gun systems would ensure that they could defend themselves and allies in all foreseeable combat situations, should they arise. By designing the ships to be optionally crewed, with high-end, interoperable, and adaptable systems, the Navy could also reduce personnel requirements and make the new class more lethal and resilient in the twenty-first-century maritime security environment. If enough of these ships were procured, the RCN would be able to expand its operations and adopt distributed maritime operations that are better suited to countering peer and near-peer threats.

Regardless of the price tag, Canada should consider procuring at least twenty-four of these vessels. This way, twelve could be allocated to each coast, allowing the Navy to more easily establish task groups and begin pivoting to distributed operations. These ships would be able to take over the Kingston class's role in conducting coastal operations, while also being able to deploy globally alongside the River-class Canadian Surface Combatants. If Canada decides to procure fewer ships than this, or ones that are less well equipped, the RCN will struggle to fulfill its mandate in the years to come.

Notes

¹ Royal Canadian Navy, “Kingston Class,” Government of Canada, n.d., <https://www.canada.ca/en/navy/corporate/fleet-units/surface/kingston-class.html>.

² Tim Fish, “Canada Initiates New OPV Project to Replace Kingston-class Maritime Coastal Defence Vessels,” Shephard Group, August 28, 2023, <https://www.shephardmedia.com/news/naval-warfare/canada-initiates-new-opv-project/>.

³ Tim Addison, “Transcript of Interview with Commander RCN, Vice-Admiral Angus Topshee,” Naval Association of Canada Speaker’s Evening, December 4, 2023, <https://www.navalassoc.ca/wp-content/uploads/2024/01/CRCN-Transcript-4-Dec-2023-NAC-Speakers-Evening-v11-Jan2024.pdf>.

⁴ Department of National Defence (DND), *Our North, Strong and Free: A Renewed Vision for Canada’s Defence* (Ottawa: DND, 2024), <https://www.canada.ca/en/department-national-defence/corporate/reports-publications/north-strong-free-2024.html>.

⁵ Kate Todd, “Lessons for Canada: Comparing Maritime Autonomous Systems Adoption Across the Five Eyes,” Canadian Global Affairs Institute, September 2024, https://www.cgai.ca/lessons_for_canada_comparing_maritime_autonomous_systems_adoption_across_the_five_eyes; Kate Todd, “Autonomous Vessels Are Revolutionizing Naval Warfare: Can Canada Keep Up?,” Canadian Global Affairs Institute, n.d., https://www.cgai.ca/autonomous_vessels_are_revolutionizing_naval_warfare_can_canada_keep_up.

⁶ Kate E. Todd, “Redesigning the Royal Canadian Navy for a More Dangerous World,” Canadian Global Affairs Institute, January 2025, https://www.cgai.ca/redesigning_the_royal_canadian_navy_for_a_more_dangerous_world.

⁷ “Canada’s Navy Recruiting Amid Shortage,” interview with Vice-Admiral Angus Topshee, CTV, December 17, 2023, <https://www.youtube.com/watch?v=PM5h2aK7Nw4>.



Kate E. Todd serves as a Public Affairs Officer in the Royal Canadian Navy’s reserves, is a fellow at Arctic360, the Canadian Maritime Security Network, the Canadian Global Affairs Institute, and the North American and Arctic Defence and Security Network, and is a member of the Canadian Maritime Security Network’s Advisory Board, Canadian Naval Review’s Editorial Board, and Mackenzie Institute’s Board of Governors.