



Domestic Icebreaking Operations

Report to Congress
July 26, 2024



U.S. Coast Guard

Foreword

July 26, 2024

I am pleased to present the following report, “Domestic Icebreaking Operations,” prepared by the U.S. Coast Guard.

The Don Young Coast Guard Authorization Act of 2022 directs the submission of the Coast Guard’s implementation plan for addressing the recommendation within the Government Accountability Office’s January 2024 audit report: “COAST GUARD: Improved Reporting on Domestic Icebreaking Performance Could Clarify Resource Needs and Tradeoffs” (GAO-24-10661).



Pursuant to Congressional requirements, this report is provided to the following members of Congress:

The Honorable Maria Cantwell
Chair, Senate Committee on Commerce, Science, and Transportation

The Honorable Ted Cruz
Ranking Member, Senate Committee on Commerce, Science, and Transportation

The Honorable Sam Graves
Chairman, House Committee on Transportation and Infrastructure

The Honorable Rick Larsen
Ranking Member, House Committee on Transportation and Infrastructure.

Should you require any additional assistance, please do not hesitate to contact my Senate Liaison Office at (202) 224-2913 or House Liaison Office at (202) 225-4775.

Sincerely,

A handwritten signature in blue ink that reads "LL Fagan".

Linda L. Fagan
Admiral, U.S. Coast Guard
Commandant



Domestic Icebreaking Operations

Table of Contents

I. Legislative Language	1
II. Background	3
III. Report	5
IV. Conclusion	9
Appendix: Abbreviations	10

I. Legislative Language

This report responds to the language set forth in Section 11212 of the Don Young Coast Guard Authorization Act of 2022 (Pub. L. No. 117-263), which reads:

SEC. 11212. GREAT LAKES WINTER COMMERCE.

(a) GREAT LAKES ICEBREAKING OPERATIONS.—

(1) GOVERNMENT ACCOUNTABILITY OFFICE REPORT.—

(A) **IN GENERAL.**—Not later than 1 year after the date of enactment of this Act, the Comptroller General of the United States shall submit to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Transportation and Infrastructure of the House of Representatives a report on Coast Guard icebreaking in the Great Lakes.

(B) **ELEMENTS.**—The report required under subparagraph (A) shall evaluate—

- (i) the economic impact of vessel delays or cancellations associated with ice coverage on the Great Lakes;
- (ii) mission needs of the Coast Guard Great Lakes icebreaking program;
- (iii) the impact that the proposed standards described in paragraph (2) would have on—
 - (I) Coast Guard operations in the Great Lakes;
 - (II) Northeast icebreaking missions; and
 - (III) inland waterway operations;
- (iv) a fleet mix analysis for meeting such proposed standards;
- (v) a description of the resources necessary to support the fleet mix resulting from such fleet mix analysis, including billets for crew and operating costs; and
- (vi) recommendations to the Commandant for Improvements to the Great Lakes icebreaking program, including with respect to facilitating commerce and meeting all Coast Guard mission needs.

(2) PROPOSED STANDARDS FOR ICEBREAKING OPERATIONS.—

The proposed standards described in this subsection are the following:

- (A) Except as provided in subparagraph (B), the Commandant shall keep ice-covered waterways in the Great Lakes open to navigation during not less than 90 percent of the hours that commercial vessels and ferries attempt to transit such ice-covered waterways.
- (B) In a year in which the Great Lakes are not open to navigation, because of ice of a thickness that occurs on average only once every 10 years, the Commandant shall keep ice-covered waterways in the Great Lakes open to navigation during not less than 70 percent of the hours that commercial vessels and ferries attempt to transit such ice-covered waterways.

(3) **REPORT BY COMMANDANT.**—Not later than 90 days after the date on which the Comptroller General submits the report under paragraph (1), the Commandant shall submit to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Transportation and Infrastructure of the House of Representatives a report that includes the following:

(A) A plan for Coast Guard implementation of any recommendation made by the Comptroller General under paragraph (1)(B)(ii) that the Commandant considers appropriate.

(B) With respect to any recommendation made under such paragraph that the Commandant declines to implement and a justification for such decision.

(C) A review of, and a proposed implementation plan for, the results of the fleet mix analysis under paragraph (1)(B)(iv).

(D) Any proposed modifications to the standards for icebreaking operations in the Great Lakes.

(b) DEFINITIONS.—In this section:

(1) COMMERCIAL VESSEL.—The term “commercial vessel” means any privately owned cargo vessel operating in the Great Lakes during the winter season of at least 500 tons, as measured under section 14502 of title 46, or an alternate tonnage measured under section 14302 of such title, as prescribed by the Secretary under section 14104 of such title.

(2) GREAT LAKES.—The term “Great Lakes” means the United States waters of Lake Superior, Lake Michigan, Lake Huron (including Lake St. Clair), Lake Erie, and Lake Ontario, their connecting waterways, and their adjacent harbors, and the connecting channels (including the following rivers and tributaries of such rivers: Saint Mary’s River, Saint Clair River, Detroit River, Niagara River, Illinois River, Chicago River, Fox River, Grand River, St. Joseph River, St. Louis River, Menominee River, Muskegon River, Kalamazoo River, and Saint Lawrence River to the Canadian border).

(3) ICE-COVERED WATERWAY.—The term “ice-covered waterway” means any portion of the Great Lakes in which commercial vessels or ferries operate that is 70 percent or greater covered by ice, but does not include any waters adjacent to piers or docks for which commercial icebreaking services are available and adequate for the ice conditions.

(4) OPEN TO NAVIGATION.—The term “open to navigation” means navigable to the extent necessary, in no particular order of priority, to meet the reasonable demands of commerce, minimize delays to passenger ferries, extricate vessels and individuals from danger, prevent damage due to flooding, and conduct other Coast Guard missions (as required).

(5) REASONABLE DEMANDS OF COMMERCE.—The term “reasonable demands of commerce” means the safe movement of commercial vessels and ferries transiting ice-covered waterways in the Great Lakes, regardless of type of cargo, at a speed consistent with the design capability of Coast Guard icebreakers operating in the Great Lakes and appropriate to the ice capability of the commercial vessel.

II. Background

Pursuant to Section 102 of Title 14, U.S. Code, the Coast Guard is authorized to develop, establish, maintain, and operate icebreaking facilities on waters other than the high seas subject to the jurisdiction of the United States. The domestic icebreaking mission is conducted in the Great Lakes, Northeast, and Mid-Atlantic regions, and encompasses four mission priorities: search and rescue; urgent response to vessels; exigent community services; and, facilitation of navigation. Search and rescue and urgent response to vessels remain core mission priorities for the Coast Guard. Exigent community services include preserving reliable waterborne access to island communities as well as working with the U.S. Army Corps of Engineers to aid in the prevention of flooding near shoreline communities. Facilitation of navigation was originally required by Executive Order 7521, dated December 21, 1936, which directed the Coast Guard to “assist in keeping open to navigation by means of icebreaking operations, in so far as practicable as the exigencies may require, channels and harbors in accordance with the reasonable demands of commerce.” The impacts of a winter ice season on the Marine Transportation System (MTS) are alleviated by domestic icebreaking operations, which provide for safe and efficient mobility of cargos essential to economic and national security.

The Coast Guard’s domestic icebreaking fleet consists of 33 assets categorized into four levels of icebreaking capability – heavy, medium, light, and ice-capable. The Coast Guard’s sole domestic heavy icebreaker, Coast Guard Cutter *Mackinaw*, is located in the Great Lakes and is capable of breaking plate ice up to and often exceeding 42-inches and ridges of more than 9-feet. The Coast Guard operates nine 140-foot domestic medium icebreakers, capable of breaking plate ice up to 36-inches and backing-and-ramming through 9-foot ridges. Six of these cutters are located in the Great Lakes and three in the Northeast. The Coast Guard also maintains eleven 65-foot domestic light icebreakers, capable of breaking plate ice up to 12-inches and backing-and-ramming through 6-foot ridges. Eight of these cutters are located in the Northeast and three in the Mid-Atlantic.

In addition to the 21 domestic icebreakers, the Coast Guard also relies on contributions provided by five 225-foot seagoing buoy tenders and seven 175-foot coastal buoy tenders. These ships are ice-capable and can provide limited icebreaking services in ice thicknesses up to 14-inches and 9-inches, respectively.

To plan for and prioritize the facilitation of navigation, the Coast Guard uses a tiered waterway system, defined as follows:

- Tier One: The connecting waterways of the MTS or other navigable waterways deemed highest-priority due to geographic location or importance of cargo to public health and safety.
- Tier Two: Navigable waterways through which cargo of significant economic importance to a region moves, or waterways which connect Tier One and Tier Three waterways.
- Tier Three: Federally maintained waterways within a port or other navigable waterways between Tier Two waterways and commercial facilities or smaller, year-round ports hosting multiple users.
- Tier Four: Wholly private or non-federally maintained waterways, piers, and docks.

The Coast Guard currently assesses, and externally reports, performance levels for facilitation of navigation by the percentage of time Tier One waterways are open during the ice season. The current goal for this performance measure is 95 percent and the Coast Guard has generally achieved this goal in all but the harshest of winters. The Coast Guard values this performance measure as it reflects the health and availability of the waterway itself. Mission planning and fleet allocations are prioritized based on the importance of individual waterways and agnostic to individual customers. Internally, the Coast Guard also collects data and other performance factors, including percentage of domestic icebreaking requests for assistance met and percentage of time domestic icebreaking assets are operationally available.

III. Report

Pursuant to Section 11212 of the Don Young Coast Guard Authorization Act (CGAA) of 2022 (Pub. L. No. 117-263), the Government Accountability Office (GAO) conducted a study of Coast Guard icebreaking operations in the Great Lakes and examined performance standards proposed by the CGAA of 2022, including discussion of any associations between ice conditions and certain economic indicators, the Coast Guard's icebreaking resource needs, and the potential effects of the proposed standards. The GAO published a report on January 16, 2024, titled, "COAST GUARD: Improved Reporting on Domestic Icebreaking Performance Could Clarify Resource Needs and Tradeoffs." The report included one recommendation: "The Commandant of the Coast Guard: Should, using data the Coast Guard already collects, report more complete performance information to Congress on its domestic icebreaking operations to better articulate resource needs and tradeoffs." The Coast Guard concurs with this recommendation.

The Coast Guard also concurs with the key takeaways in the report, as they align with current efforts to improve management of the domestic icebreaking mission.

Plan for Implementation of GAO's Recommendation

The Coast Guard intends to update current performance measures and develop new ones, using data already collected, to better address mission outcomes, inform current and future resourcing needs, and provide increased transparency for public customers and industry partners. The future slate of reported performance measures will include:

- Percent of domestic icebreaking requests met. This performance measure is currently tracked internally, as it contributes to effective planning and management of the mission, but it is not widely reported externally. The data required for this performance measure is currently collected through routine engagements with those requiring icebreaking services. The Coast Guard intends to formalize this performance measure for external reporting and record data with the ability to disaggregate the data by factors such as:
 - Whether the request supports an urgent response for icebreaking assistance, exigent community services, or facilitation of navigation;
 - The entity making the request, including flag state of requestor, type of vessel making the request, etc.; and
 - Documentation of factors contributing to negative responses, such as ice conditions not warranting icebreaking services, unplanned casualties to icebreakers, and higher priority missions/requests.

This performance measure will reflect the Coast Guard's performance in the response, vice prevention, aspect of the domestic icebreaking mission.

- Percentage of time domestic icebreaking assets are operationally available during the ice season. This performance measure is currently tracked internally but not widely shared externally. This performance measure will provide a view on how reliable the icebreaker fleet is performing, document resources being expended to correct unplanned casualties, assess effectiveness in conducting planned maintenance, and provide data for resourcing and

acquisition decisions. The data required to support this performance measure is currently collected and available through established operational reporting provided by the icebreaker fleet:

- Total operational hours provided by Coast Guard icebreakers during the ice season;
- Scheduled maintenance hours during the icebreaking season;
- Unscheduled casualties and maintenance hours during the icebreaking season; and
- Resources expended to correct unscheduled casualties.

This performance measure will reflect the health and reliability of the Coast Guard domestic icebreaking fleet.

- Icebreaking partner contributions. The Coast Guard is the only federal agency that holds statutory authority to operate and maintain icebreaking resources. However, successful completion of this mission is also reliant upon the Coast Guard's mission partners, primarily the Canadian Coast Guard and commercial icebreaking providers. Those partners contribute to an integrated system of icebreaking capabilities that provides economies of scale and flexibility to address changing mission needs and environmental conditions. While this will be a new performance measure, the data is available through already established partner relationships. Specifically, this performance measure will consider:
 - Quantitative data regarding Canadian Coast Guard icebreaker operations, including total operational and maintenance hours similar to what is tracked for the Coast Guard fleet.
 - Quantitative data of U.S. Coast Guard and Canadian Coast Guard icebreaker operations, including time spent in each other nation's waterways and number of other nation's vessels assisted.
 - Occasions of commercial icebreaker operations, including duration of work, priority level of the location of work, and whether the commercial icebreaker work was adequate for the customer. The Coast Guard will also look to assess how the commercial icebreaker work allowed the Coast Guard's icebreakers to perform work in higher priority waterways.

This performance measure will reflect the performance of the entire system of icebreaking assets.

- Expanded reporting on percentage of time the current tiered waterway system is open during ice season. This performance measure will be based upon the current performance measure of percentage of time Tier One waterways are open during the ice season. For this measure, the term "open" is defined as a waterway that is not restricted or closed due to ice conditions. Efforts to refine and strengthen this measure commenced in 2019 to alleviate concerns that the measure had become stagnant and diluted.
 - Since the 2019-20 ice season, the Coast Guard has internally tracked the percentage of time Tier Two waterways are available during ice season for the Great Lakes region. This effort will be codified for external reporting and expanded to also include the Northeast and Mid-Atlantic regions.
 - Since the 2019-20 ice season, this measure was also disaggregated in the Great Lakes to internally record separate results for the time periods before, during, and after the closure of the Soo Locks that separate Lake Superior from the lower Great Lakes.

This was done to reduce a false increase in availability resulting from decreased vessel demand during the lock closure. This effort will be codified for external reporting.

- During the 2022-23 ice season, the Coast Guard changed how it considered a waterway to be restricted or closed due to ice conditions. In prior years, a waterway was restricted or closed when a vessel was beset by ice and impeding other vessels from passing. Recognizing that any vessel beset or affected by ice affects the safety and reliability of the waterway, the Coast Guard now considers a waterway to be restricted or closed once a single vessel is beset.
- The goal for the current performance measure of percentage of time Tier One waterways are available is 95 percent. The Coast Guard intends to use 95 percent as the initial target goal for the new expanded reporting on waterway availability and continue to evaluate whether this still appropriately reflects mission performance or if the goal needs to be adjusted.

This performance measure will continue to be the most significant as it reflects the health and availability of the MTS for all vessels.

Review of Fleet Mix Analysis

The GAO report did not propose a new fleet mix, but cited a fleet mix analysis previously provided by the Coast Guard to Congress in April 2023, and reinforced “that agencies, such as the Coast Guard, should base major ship acquisitions on a good business case, which includes setting firm requirements, and ensuring that technologies are fully developed and the design is stabilized before construction to avoid delays.” The Coast Guard concurs with GAO’s evaluation. The fleet mix analysis provided in April 2023 found that the current fleet size met assigned mission needs. The age and increasing maintenance requirements of the current fleet, however, pose an operational risk. The fleet mix analysis recommended an adjusted mix of in-kind capacity replacement to meet the Coast Guard’s needs. A fleet consisting of two heavy domestic icebreakers, eleven medium domestic icebreakers, and seven light domestic icebreakers would best meet operational demands. In pursuit of implementing this plan, the Coast Guard is currently in the “Need” phase of the acquisition lifecycle framework, documenting the domestic icebreaker capability requirements that will inform upcoming recapitalization efforts.

Modifications to Proposed Standards for Icebreaking Operations

The Coast Guard concurs with the GAO’s evaluation that while the proposed performance standards may provide more detailed information about certain characteristics of the domestic icebreaking mission, they would come at a significant cost to both the Coast Guard as well as certain industry partners. Calculating the performance standards as proposed would require excessive amounts of ship tracking data cross-referenced with on-scene ice conditions at any given time or location. The Coast Guard does not currently collect this data, and efforts to collect it would pose data collection and resource challenges and could require supplementary regulations. Additionally, this data would primarily be used for performance measure reporting and would not improve operations (e.g., mission planning, fleet staging and allocation, or risk-management decision-making).

The Coast Guard concurs with the need to provide better performance reporting, both to inform future resourcing and trade-off decisions, as well as to increase transparency to the public and industry. For those reasons, the Coast Guard proposes to move away from the standards proposed in the CGAA of 2022, and instead move forward with the slate of performance measures provided previously in the report and reiterated below:

- Percent of domestic icebreaking requests met,
- Percentage of time domestic icebreaking assets are operationally available during the ice season,
- Icebreaking partner contributions, and
- Expanded reporting on percentage of time the current tiered waterway system is open during ice season, specifically the availability of Tier One and Tier Two waterways.

Efforts to implement these performance measures are already underway. In the spirit of continuous improvement and transparency, the Coast Guard intends to evaluate, refine, and consider additional measures during the 2024 off-season, and consult with industry partners throughout the process. Adjustments will be evaluated during the 2024-2025 ice season and final results will be codified in the next iteration of Commandant Instruction 16151.1(series), “Domestic Icebreaking Operations Policy.”

IV. Conclusion

The Coast Guard is the only federal agency statutorily authorized to operate and maintain domestic icebreaking capabilities for the United States. Working with the Canadian Coast Guard and commercial icebreaking providers, the Coast Guard provides an integrated system of icebreaking capabilities that provides economies of scale and flexibility to address evolving mission needs and environmental conditions. The domestic icebreaking fleet conducts operations in search and rescue, urgent response to vessels beset in ice, exigent community services, and facilitation of navigation. The Coast Guard provides safe and reliable access to the MTS year-round, ensuring economic and national security even through the winter season.

The greatest challenge to the Coast Guard's ability to provide reliable domestic icebreaking services is its aging domestic icebreaker fleet. Efforts to sustain and recapitalize the domestic icebreaker fleet are underway, and the Coast Guard concurs with the GAO report that more complete reporting on domestic icebreaking mission performance is necessary to better articulate resourcing needs. While the performance standards proposed in Section 11212 of the CGAA of 2022 aim to enhance Coast Guard operations, they present data collection, regulatory, and resourcing challenges, and may result in tradeoffs that potentially detract from other domestic icebreaking mission needs.

The performance standards proposed by the Coast Guard in this report will fully encapsulate performance in the domestic icebreaking mission without the same challenges and tradeoffs. The Coast Guard looks forward to continuing to develop these standards to not only provide a clearer picture of the resources needed to accomplish this mission, but also provide increased transparency for the public and industry.

Appendix: Abbreviations

Abbreviations	Definition
CGAA	Don Young Coast Guard Authorization Act of 2022
GAO	Government Accountability Office
MTS	Marine Transportation System