



Chelsea Creek Ship Simulation Study Site Reconnaissance

ERDC Dredging Operations Technical Support Program (DOTS)

U.S. ARMY CORPS OF ENGINEERS

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Response Summary:

The USACE New England District (NAE) and the Massachusetts Department of Transportation (MassDOT) are conducting a Planning Assistance to States (PAS) technical study to improve navigation at the Chelsea Creek waterway in Boston Harbor. This study focuses on the federal navigation channel through and around the Chelsea Street Bridge, where bridge openings for maritime traffic disrupt vehicular traffic crossing the bridge. Currently, the bridge limits safe passage to vessels with a beam of 90 ft or less. Vessels with a 90 ft beam are limited to daytime transits during high tide due to safety concerns caused by the narrow channel through the bridge, hydrodynamic factors, and reduced visibility at night. The study aims to identify improvements enabling safer, 24/7 access for deep-draft vessels up to 106 ft in beam to transit through the bridge. Expanding transit capability would reduce conflicts with bridge traffic and provide greater operational flexibility.



The NAE submitted a DOTS request for the ERDC Coastal and Hydraulics Laboratory (CHL) to conduct a site reconnaissance of Chelsea Creek in support of a ship simulation study using the ERDC Watercraft and Ship Simulator. ERDC CHL personnel met with experienced pilots from the Boston Harbor Pilots Association and Boston Harbor Docking Pilots to understand the challenges of navigating the waterway. Further discussions were held with representatives from the Boston pilots, NAE, DLA Piper, Irving Oil, Energy Transfer, and the US Coast Guard Sector Boston Waterways. The ERDC CHL team and NAE engineers joined Boston pilots on vessel transits in Boston Harbor, directly observing operations and gathering crucial information on waterway usage and vessel handling. The photos and videos collected during this reconnaissance will be used to create an accurate and realistic simulation environment, modeling the waterway's conditions and vessel behavior.

Period of Performance:

This work was performed on 28 April 2025 to 3 May 2025.

Benefits of the Response to the USACE Dredging/Navigation Program:

This study demonstrates the ERDC's commitment to supporting the USACE Civil Works Navigation Mission. The study directly contributes to the safe and efficient use of federal waterways, bolstering maritime commerce in the Boston Harbor region. Chelsea Creek is a critical waterway for Boston's fuel supply, serving as a primary import and storage location for petroleum products. By enabling 24/7 transits for larger vessels, the study aims to optimize waterway utilization, reduce conflicts with bridge traffic, and enhance the reliability and resilience of the regional fuel supply.

Deliverable:

The data collected during the reconnaissance – including photos, videos, and other information – will be used to develop a realistic simulation environment for testing proposed navigation improvements. The proposed improvements will be evaluated using data obtained from simulations and insights gathered directly from Boston pilots, who will participate in the simulations by operating the simulator. Following ship simulation testing, the ERDC CHL will deliver a comprehensive Technical Report detailing the methodology, results, and recommendations from the ship simulation study. The report will describe the reconnaissance, the development and results of the hydrodynamic models and ship simulation databases, data analysis of the simulation exercises, an evaluation of vessel maneuverability and safety, and specific recommendations for designs to improve safe navigation on Chelsea Creek.



Providing environmental and engineering technical support to the U.S. Army Corps of Engineers
Operations and Maintenance navigation and dredging missions

Shannon Stever • Shannon.N.Stever@usace.army.mil
Elizabeth Grace Staebell • Elizabeth.G.Staebell@usace.army.mil
ERDC Coastal and Hydraulics Laboratory

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