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United States Coast Guard

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16591
February 08, 2022

Mark A. Assam, AICP
U.S. Department of Transportation
Federal Transit Administration, Region X
915 2nd Avenue, Suite 3142
Seattle, WA 98174-1002

Dear Sir:

This letter serves to document the Coast Guard's Preliminary Navigation Clearance Determination (PNCD) for the Sound Transit (ST) Ballard light rail bridge project over Lake Washington Ship Canal (LWSC) near Ballard, WA. At the request of the Coast Guard, ST prepared a Navigation Impact Report (NIR) and delivered it to the Coast Guard in May of 2021. The Coast Guard reviewed your NIR and published a Navigation Public Notice to seek comments from maritime stakeholders. The Navigation Public Notice comment period ended on October 15, 2021, and the Coast Guard received approximately 50 comments. Both the NIR and public comments informed our PNCD.

Congress has directed the Coast Guard, via various statutes, to maintain the freedom of navigation on navigable waters of the United States and to prevent impairments involving navigable streams. The Coast Guard's duty and responsibility under these authorities is to preserve the right of navigation. Therefore, as a general rule, the Coast Guard is not in favor of reducing riparian maritime capacity or capability (e.g. marinas, cruise ship docks, marine construction with tug and barge facilities, fishing vessel moorage, etc.).

Your preferred alternative, IBB-1a Fixed Bridge east of Ballard Bridge, and other proposed bridge alternatives do not meet all the reasonable needs of navigation. Additionally, IBB-1a Fixed Bridge would obstruct navigation, eliminate current navigation availability, and preclude the development of potential future navigation utilities. In your administrative Environmental Impact Statement, you discuss tunnel alternatives. These tunnel alternatives would meet all known reasonable navigation needs at the subject location, and therefore, pose no impairment to current or prospective future navigation (*See* Enclosure 2 and 3).

Summary Conclusion for Preliminary Navigation Clearance Requirements

1. **Minimum vertical navigation clearance (VNC) of any proposed bridge.**
    a. Any proposed bridge would preferably have unlimited VNC (bascule bridge) or at a minimum 205 feet of VNC at the main navigation channel. Any side channels would require vertical clearances as high, or higher than the current

Ballard Bridge side channels (existing Ballard Bridge bents to the north and south of the movable bridge span).

b. VNC is referenced above LWSC at High Water as published by the Army Corps of Engineers (ACOE).

2. **Minimum horizontal navigation clearance (HNC) of any proposed bridge**
   a. ST alternative IBB-3, west of the current Ballard Bridge, proposed a HNC of 150 feet. The Coast Guard would require a minimum of 200 feet of HNC for this alternative, and the pier faces should be north and south of the current main channel bridge faces, normal to the axis of the channel, which is skewed approximately 20 degrees.
   b. ST alternative IBB-1a, which is east of the current Ballard Bridge, proposed a HNC of 290 feet. This would provide adequate HNC at the waterline.

Factors that informed our conclusion on Vertical Clearance:

Unlike the Duwamish waterway, the Coast Guard did not establish guide clearances for the LWSC. However, ST's NIR and Public Notice comments documented a current and a verified future need to support vessels with a mast height greater than 136 feet east of the current Ballard Bridge. In 1917, the ACOE established the Hiram M. Chittenden Ballard Locks (Ballard Locks) 0.3 miles east of the confluence of Puget Sound and the current LWSC. Since then, the LWSC has provided a navigable channel for all vessels that utilize maritime facilities east of the locks and can fit within the lock dimensions of 825 feet long by 80 feet wide. The Ballard Locks are one of the busiest pieces of maritime infrastructure in the nation. The ACOE channel water depth from the locks to Lake Union is 30 feet (see Coast Pilot and relevant NOAA chart). Approximately 40,000 ships, boats and barges pass through the Ballard Locks each year, making it the nation's largest volume lock system by overall traffic. For the last 104 years, vessels freely transited from the Pacific Ocean through the Ballard Locks, including transit past three moveable bridges with unlimited VNC. The first VNC obstruction on this transit is a power line at LWSC mile 1.93 at the mouth of the Fremont Cut with a VNC of 160 feet. The second VNC obstruction is the George Washington Memorial Bridge (SR99) at LWSC mile 2.7 which has VNC of 136 feet. Of note, there is a claim that the George Washington Memorial Bridge provides a greater VNC than is currently advertised; however, this disparity is not yet validated.

ST proposes to build a new fixed bridge near waterway mile 1.1 that would have a **limited** VNC of 136 feet. This proposed bridge would be in close proximity to the current Ballard Bridge which has **unlimited** VNC. With unlimited VNC, the Ballard Bridge meets the current and future reasonable needs of navigation. ST's proposed bridge would be the new limiting VNC obstruction west of the power lines at mile 1.93, and for the first time in history, would obstruct navigation to vessels requiring greater than 136 feet of VNC. The LWSC waterway east of the proposed bridge currently supports vessels with air drafts exceeding 136 feet and with no improvements, can continue to support vessels with VNC requirements in excess of 136 feet well into the next century. As an example from the NIR, pg. 39, 57, 58 two marine service facilities, Foss and LeClercq Marine Construction (LeClercq), are located upstream/east of both proposed bridge alternatives and service vessels used for marine construction and sailing vessels exceeding the vertical clearance restriction of either proposed bridge (*See* Pages 39, 57 and 58). Foss

moved out of the aforementioned facilities; however, the vacant waterfront facility is capable, without improvement, to moor and service vessels with vertical clearance requirements greater than 136 feet, which includes haul-out services with three available dry docks. Also, "the Port of Seattle, National Marine Trade Association, and businesses that cater to superyachts are actively working world wide to attract them to Salmon Bay and Elliott Bay by creating a cluster of superyacht service facilities in Seattle," (*See* Page 39 of the NIR). There are currently over a dozen superyachts with air drafts over 136 feet that have entered LWSC over the last several years with approximately five vessels visiting LWSC every year (see NIR and NIR update December 9, 2021). Services conducted at these facilities represent up to millions of dollars of business per vessel visit in addition to the ancillary marine service businesses (lodging, food services, marine supply, etc.). The super yacht vessels mentioned above travel the world and may transit the Panama Canal, which has a vertical clearance restriction of 205 feet (62.5m) (see NGA SD Pub 153 para 9.13). This global restriction was a factor in the Coast Guard's VNC determination and would impact two vessels the CG is aware of that have previously transited this waterway.

Factors that informed our conclusion on Horizontal Clearance:

There are four horizontal navigation obstructions between Puget Sound and the George Washington Memorial Bridge: the Burlington Northern and Santa Fe Salmon Bay Rail Bridge (150 feet of HNC), Ballard Locks (80 feet of HNC), Ballard Bridge (150 feet of HNC), and the Fremont Bridge (120 feet of HNC). Therefore, typical mariners transiting from Puget Sound to Lake Union experience at least 150 feet of HNC from Puget Sound all the way to the Fremont Bridge with the exception of the Ballard Locks (*See* Enclosure 4).

In February and March 2020, ST partnered with the Seattle Maritime Academy, Wärtsilä Voyage Solutions, Coastal Transportation, Seattle Ferry Service, UnCruise Adventures, and Western Towboat to conduct preliminary navigation simulations of the proposed bridge alternatives over Salmon Bay. Forty-five runs were conducted in the simulations, which included various weather and daylight conditions. Seventeen of the runs were "preliminary" (practice) and 28 were "final." Of the 28 "final" runs: six indicated no change to the typical navigation course or existing needs of navigation, 22 indicated a change to the typical navigation course or existing needs of navigation (most commonly to avoid the conceptual piers), and four resulted in an allision with either the Ballard Bridge, the fixed bridge concept, or a stationary vessel during runs with high winds, additional vessel traffic, or at night. None of the "final" runs resulted in a collision with another moving vessel (*See* the Simulation Report).

> *Feedback during the navigation simulations indicated that the IBB-3 pier placement would also block critical lines of sight for both eastbound and westbound vessels, as well as constrain outbound and inbound access between the navigation channel and Fishermen's Terminal. For example, several vessels in the simulations were not able to turn directly from the navigation channel into Fishermen's Terminal or vice-versa because IBB-3 reduced the area available to merge into the navigation channel and created tight turns into and out of Fishermen's Terminal. These vessels had to travel out of-direction and turn around to sail toward their destination. This impact could affect vessels accessing all of the Fishermen's*

Terminal facilities. Figure 11 shows an example of a tight turn out of Fishermen's Terminal and eastbound into the navigation channel (*See* NIR, Page 66 and Enclosure 3).

During the simulations three vessels allided with the northern Ballard Bridge fender. The allisions occurred for various reasons that are all a subset of the facts that the waterway through this area is extremely narrow for vessel maneuvering. The lack of space for maneuvering is exacerbated by a slight bend in the channel and shoaling at the south end of the channel. These factors together result in an area requiring extreme care from vessel operators. Therefore, for the IBB-3 alternative, the Coast Guard would require a minimum of 200 feet of HNC and the pier faces should be north and south of the current main channel bridge faces, normal to the axis of the channel, which is skewed approximately 20 degrees (*See* Enclosure 1 and 3).

For vessel traffic traveling east or west the 290 feet of HNC proposed for IBB-1a is more than adequate to meet the reasonable navigation needs for a fixed bridge that has 205 feet of VNC. Understanding the engineering challenges associated with spanning 290 feet of HNC with a bascule bridge, it would be acceptable to have 125 feet of HNC from tip-to-tip of any bascule lift bridge spans, centered over the ACOE federal project channel. With regard to future operations of any proposed lift bridge, the higher the fixed portion of a lift bridge, the less the bridge will need to open for passage of vessels. (*See* Enclosure 5 for an example).

As a general observation, the introduction of a new bridge at either IBB-3 or IBB-1a into the already narrow, heavily trafficked waterway, creates hazards to navigation that prove challenging even for highly experienced mariners to navigate. The general location ST proposes is not ideal for a new bridge as it presents an obstruction to navigation when taking into account existing infrastructure and current waterway use.

Please note, this preliminary determination does not constitute an approval or final agency determination. A final agency determination must be made in accordance with regulation after ST submits a complete bridge permit application.

Sincerely,

HARRIS.BRENDAN.J.1013137303 Digitally signed by HARRIS.BRENDAN.J.1013137303 Date: 2022.02.08 12:13:07 -08'00'

B. J. HARRIS
Chief, Waterways Management Branch
Coast Guard District Thirteen
By direction of the District Commander
U.S. Coast Guard

5 Enclosures

Enclosure 1

Figure 11 Reduced Turning Radius between Fishermen's Terminal and the Ship Canal Navigation Channel

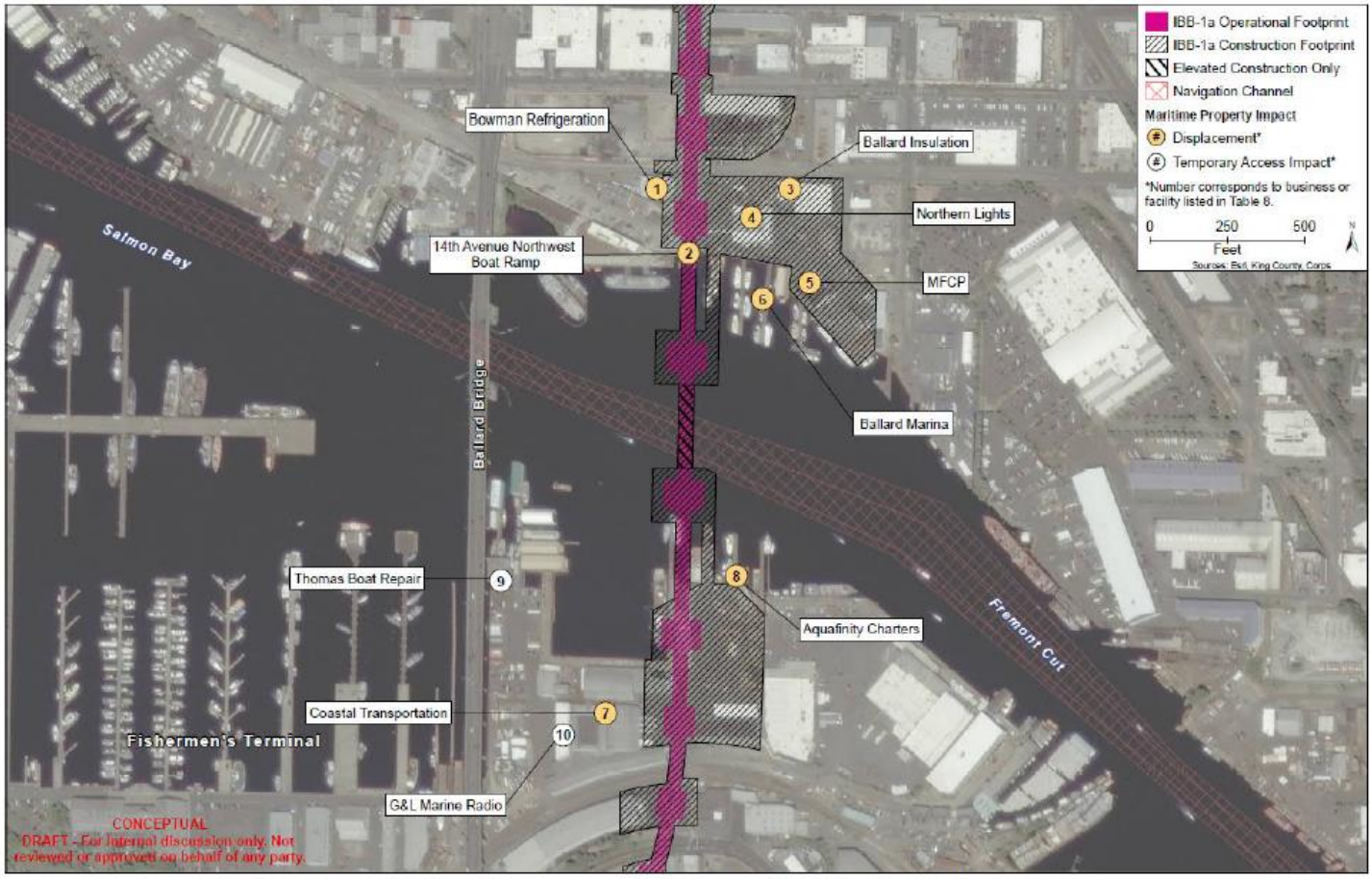


Figure 8 **Maritime Businesses and Marine Facilities Affected by IBB-1a**

Enclosure 3

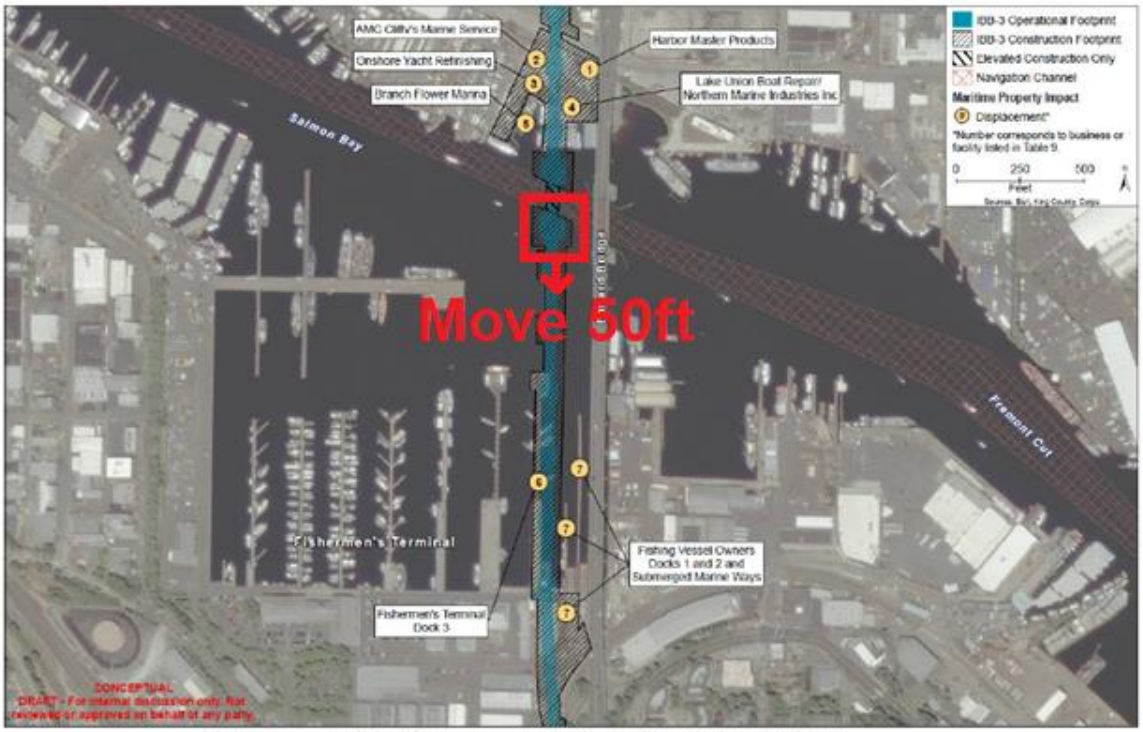
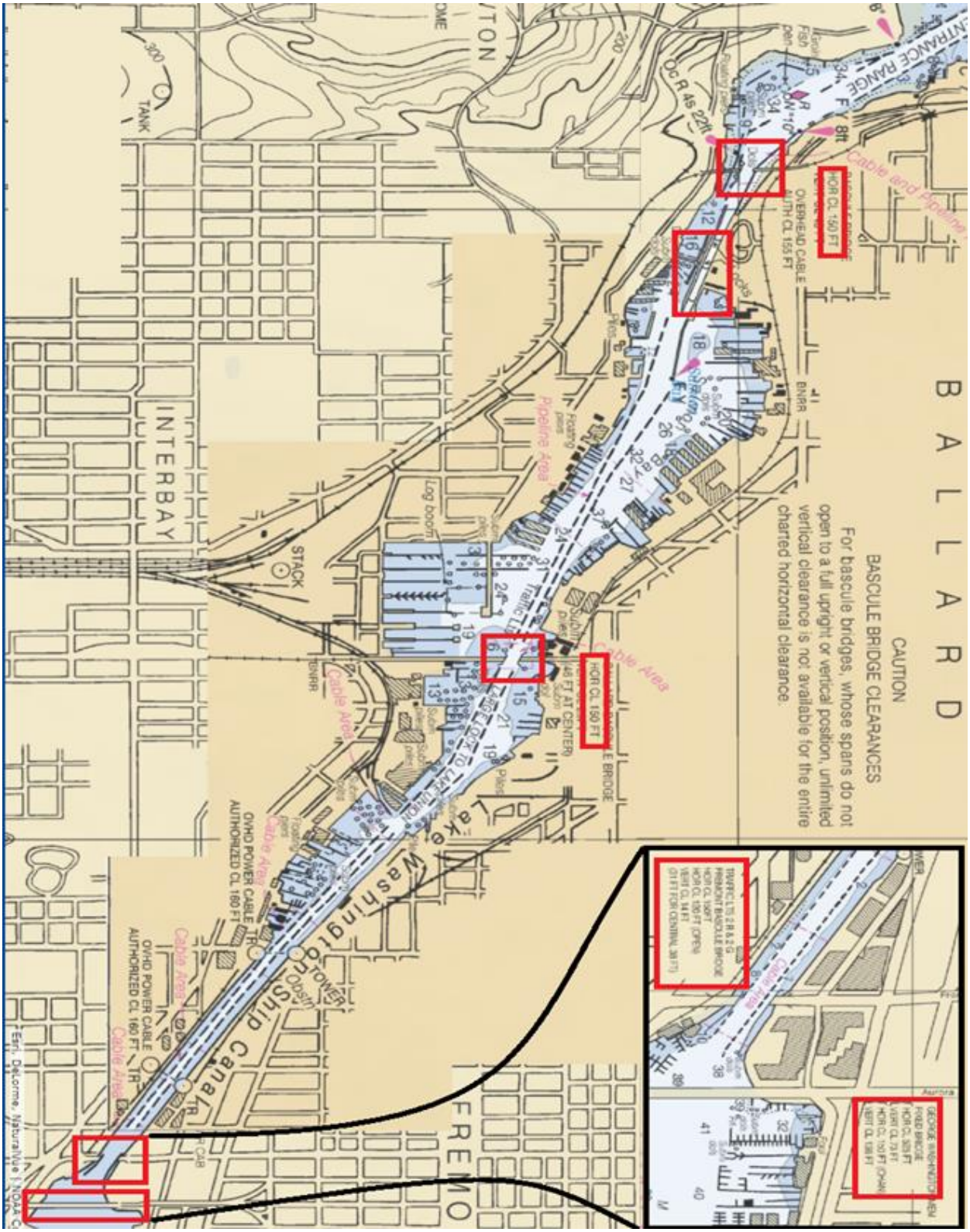
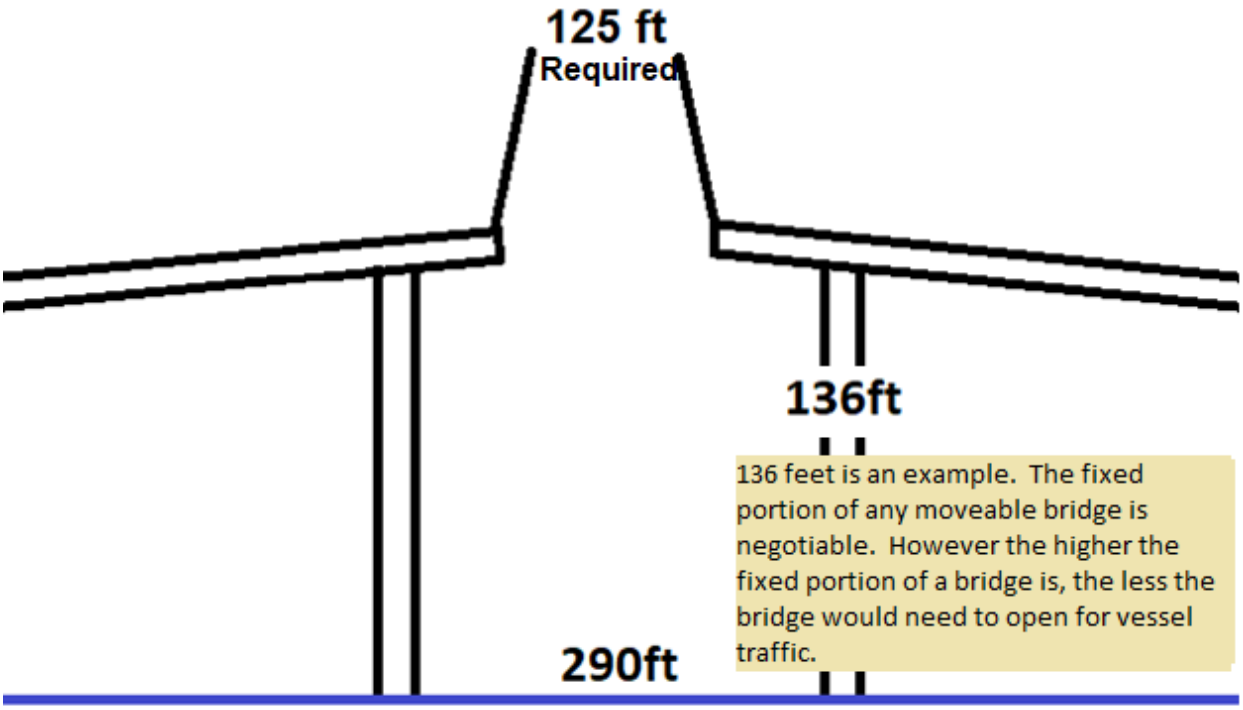


Figure 9 Maritime Businesses and Marine Facilities Affected by IBB-3

Enclosure 4


BALLARD
CAUTION
BASCULE BRIDGE CLEARANCES
For bascule bridges, whose spans do not open to a full upright or vertical position, unlimited vertical clearance is not available for the entire charted horizontal clearance.
INTERBAY
FREMO
Lake Washington Ship Canal
HOR CL 150 FT
OVERHEAD CABLE AUTH CL 155 FT
OVHD POWER CABLE AUTHORIZED CL 160 FT
Cable and Pipeline
Pipeline Area
Cable Area
Log boom
STACK
TANK
BNRR
Esri, DeLorme, NavInfo | NOAA

Enclosure 5


125 ft
Required
136ft
136 feet is an example. The fixed portion of any moveable bridge is negotiable. However the higher the fixed portion of a bridge is, the less the bridge would need to open for vessel traffic.
290ft