

1. Administrative Details

Proposal Name: Modification to Houston-Galveston Ship Channel project for Galveston Bay Widening

by Agency: Port of Houston Authority of Harris County, Texas

Locations: TX

Date Submitted: 08/20/2018

Confirmation Number: aa26fa7f-2517-406b-b9de-0261e7a74735

Supporting Documents

File Name	Date Uploaded
PHA 7001 Mod Widen Bay Reach.pdf	08/20/2018
Pilot Letter.pdf	08/20/2018
PHA 7001 mod HGNC widen channel .pdf	08/20/2018

2. Provide the name of the primary sponsor and all non-Federal interests that have contributed or are expected to contribute toward the non-Federal share of the proposed feasibility study or modification.

Sponsor	Letter of Support
Port of Houston Authority of Harris County(Primary)	The Port of Houston Authority (PHA) was the first federal cost share partner with the U.S. Army Corps of Engineers. PHA fully supports the project, which will help assure continued safe and efficient navigation for the number one port for foreign commerce and exports in the U.S. Maritime associations, industry, and the U.S. Coast Guard support channel improvements for improved safety, reduction in congestion, and which would enable effective operation of the busiest deep draft port (22,000 deep draft vessels and over 130,000 barge tow movements annually). The Port of Houston is the largest petrochemical complex in the world and the second largest U.S. port in total tonnage. The port generates over 2.7 million more than \$629 billion in economic impact to the nation. The expanding economy, the increasing demand for containerized commerce (Houston conducts 70% of container volume in the U.S. Gulf of Mexico), and increasing size of vessels through the expanded Panama Canal and from Europe all require channel improvements to be made. This proposed project serves that requirement.

3. State if this proposal is for a feasibility study, a modification to an authorized USACE feasibility study or a modification to an authorized USACE project. If it is a proposal for a modification, provide the authorized water resources development feasibility study or project name.

[x] Modification to an Authorized USACE Project : Houston-Galveston Navigation Channels Project, Texas

4. Clearly articulate the specific project purpose(s) of the proposed study or modification. Demonstrate that the proposal is related to USACE mission and authorities and specifically address why additional or new authorization is needed.

The Port of Houston Authority (PHA) was the first federal cost share partner with the U.S. Army Corps of Engineers. PHA fully supports the project, which will help assure continued safe and efficient navigation for the number one port for foreign commerce and exports in the U.S. Maritime associations, industry, and the U.S. Coast Guard support channel improvements for improved safety, reduction in congestion, and which would enable effective operation of the busiest deep draft port (22,000 deep draft vessels and over 130,000 barge tow movements annually). The Port of Houston is the largest petrochemical complex in the world and the second largest U.S. port in total tonnage. The port generates over 2.7 million more than \$629 billion in economic impact to the nation. The expanding economy, the increasing demand for containerized commerce (Houston conducts 70% of container volume in the U.S. Gulf of Mexico), and increasing size of vessels through the expanded Panama Canal and from Europe all require channel improvements to be made. This proposed project serves that requirement.

5. To the extent practicable, provide an estimate of the total cost, and the Federal and non-Federal share of those costs, of the proposed study and, separately, an estimate of the cost of construction or modification.

	Federal	Non-Federal	Total
Study	\$1,000,000	\$1,000,000	\$2,000,000
Construction	\$257,000,000	\$86,000,000	\$343,000,000

Explanation (if necessary)

The Port of Houston Authority and the U.S. Army Corps of Engineers executed a Feasibility Cost Share Agreement to conduct a feasibility study of improvements to the Houston Ship Channel, including widening of the channel through Galveston Bay and other improvements through the channel system as would be necessary for safe and efficient navigation. The “mega-study” received a Congressional waiver for cost and schedule, has been fully funded to date. A Chief’s report is scheduled for October 2019. Project costs have been developed to a planning stage level of confidence to widen the Galveston Bay section of the HSC from 530 feet to 700 feet at the authorized depth of 46.5 feet Mean Lower Low Water.

6. To the extent practicable, describe the anticipated monetary and nonmonetary benefits of the proposal including benefits to the protection of human life and property; improvement to transportation; the national economy; the environment; or the national security interests of the United States.

Widening of the Galveston Bay reach of the HSC was evaluated through navigation simulations to determine the minimum safe widths for meeting vessels. The channel is currently 530 feet wide. The simulation indicated that a minimum width of 700 feet was required for meeting of study design vessels. The Port of Houston is the nation's largest and most important energy port. The proposed project would strengthen the national energy security posture, and facilitate continued growth of foreign commerce. Widening of the full bay reach would enable safe meeting and two-way traffic for neo-Panamax container ships, Suezmax tankers, and wide-body dry bulk carriers. Widening would minimize the reverting to one-way traffic movements, which would cause massive operational disruption of the busiest deep draft ship channel in the U.S. (22,000 deep draft vessel moves annually) because of vessel traffic congestion. Additionally, widening is expected to reduce the rate of vessel casualties and accidents as a result of unavoidable overtaking maneuvers in the bay that would occur with one-way vessel convoys. Because over 80% of HSC tonnage is hazardous cargo, safer vessel movements will minimize life safety and environment consequences of accidents. Annualized National Economic Development benefits from full widening are estimated at \$27,000,000, without consideration of risk reduction benefits from avoidance of catastrophic impacts to the economy that would occur with a prolonged closure of the H-GNC.

7. Does local support exist? If 'Yes', describe the local support for the proposal.

Yes

Local Support Description

The Port of Houston generates over \$629 billion in economic impact to the Nation, and over \$35.4 billion in national, state and local tax revenue. The port generates 16.1% of the state GDP, and over 1.174 million jobs in Texas. Because of the huge impact of the Port of Houston, local support for channel improvement projects which enable safe and efficient commerce, stimulate additional growth in maritime sector, support growth of the state and region, and protect the environment and national economic security are strongly supported. The regional Lone Star Harbor Safety Committee, representing all maritime sectors, channel users, and harbor pilot associations strongly support widening of the full bay reach as a crucial requirement for future safe and efficient navigation.

8. Does the primary sponsor named in (2.) above have the financial ability to provide for the required cost share?

Yes

Primary Sponsor Letter of Support

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PHA 7001 Mod Widen Bay Reach.pdf



August 20, 2018

Colonel Lars Zetterstrom
Commander, Galveston District
U.S. Army Corps of Engineers
P.O. Box 1229
Galveston, Texas 77553-1229

Subject: Letter of Support for Section 7001 Proposal for Study of the Feasibility of Developing Salt Domes for Dredge Material Disposal

Dear Colonel Zetterstrom,

The purpose of this letter is to express the support of the Port of Houston Authority for a study of the feasibility of developing salt domes or bedded strata for dredge material disposal from the Houston Ship Channel system.

The Port of Houston Authority (PHA) is the non-federal sponsor of the ship channel area of the proposed study. This disposal study was previously recommended to the district as a potential continuing Authorities Project, but that request has not been fruitful. PHA has briefed and discussed this disposal concept with natural resource agencies at the Beneficial User's Group Interagency Coordination Team meetings and received support for pursuing this concept as a way to minimize impacts to Galveston Bay from continued operations and maintenance of federal channels and berths. As the PHA is required to acquire lands for future placement areas and cost share continuing construction, PHA supports options which additionally minimize federal and sponsor costs. PHA's preliminary research and discussions with the geologists, salt dome storage operators, and natural resource agency representatives have led us to believe that the concept is viable, realistic, and so deserves further study and analysis.

The Houston Ship Channel is the busiest deep draft ship channel in the U.S., and is the conduit for over 250 million tons of commerce annually. The channel requires regular and routine maintenance dredging to assure efficient vessel moves. Because of the volume of dredging required to sustain navigation and the path through the delicate and valuable Galveston Bay estuary, our channel partnership needs to investigate and support all feasible alternatives to traditional dredge material disposal.

This letter is not a commitment for funding the proposed study. That commitment can only be made when a Federal Cost Share Agreement with USACE is executed by the Port Authority. The Port Authority will continue to provide staff assistance to USACE efforts to advance the proposal, including providing supplemental information as may be necessary or useful.

The Port Authority looks forward to continuing our work on this study proposal with your staff in order to achieve the mutual long-range goals for maintenance of the channel system.

Sincerely,

A handwritten signature in black ink, appearing to read 'R. Guenther', with a long horizontal flourish extending to the right.

Roger Guenther
Executive Director

Additional Proposal Information

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Pilot Letter.pdf



June 6, 2018

Col. Lars Zetterstrom, P.E.
USACE Galveston District
P.O. Box 1229
Galveston, TX 77553-1229
Via email to: Lars.N.Zetterstrom2@usace.army.mil

Dear Col. Zetterstrom:

Members of the Houston port region maritime industry are concerned with the current findings of the Army Corps of Engineers feasibility study of the Houston Ship Channel Expansion Channel Improvement Project that indicate there is not a sufficient benefit-to-cost ratio to justify widening the Houston Ship Channel between Redfish Island and Morgan's Point.

We respectfully submit the attached white paper that illustrates that the costs of failing to implement the widening project through Morgan's Point have been severely underestimated. The increased costs of vessel day rates alone are conservatively estimated at \$20 million per year due to delays that will occur without the widening project.

Two-way transits are necessary for safety and economic growth along the Houston Ship Channel.

Our intention is to share this white paper with our congressional delegation and our peers in industry. To continue the dialog with any of the below signed industry leaders about the importance of the widening project to current and future safety and commerce, please contact CAPT Bill Diehl (USCG), Ret., P.E. at (713) 678-4300 or bdiehl@txgulf.org.

Best regards,

Vinny Pilegge
Chairman, Greater Houston Port Bureau
President
Manchester Terminal, LLC

Bernt Netland
1st Vice Chairman, Greater Houston Port Bureau
President & CEO
Intercontinental Terminals Co. LLC

Vincent J. Di Cosimo
2nd Vice Chairman, Greater Houston Port Bureau
Senior VP – Petroleum Logistics
Targa Resources

CAPT Robert Baker, USN (Ret.)
Secretary-Treasurer, Greater Houston
Port Bureau
Marine Superintendent
ExxonMobil Baytown Refinery

Charles Flournoy
Immediate Past Chairman, Greater
Houston Port Bureau
Consultant
John L. Wortham & Son, LLP

April Bailey
Executive VP – Commercial Banking
Amegy Bank NA

Richard Bertrand
Business Director
Stolt Tanker Trading

James A. Black
President/CEO
Moran Gulf Shipping

Robert H. Blades
President
Blades International, Inc.

G.R. "Jerry" Cardillo
President & CEO
Contanda LLC

Capt. Tim J. Downs
General Manager, Shipping & Maritime
– Americas
Shell Trading (US) Company

Mickey Franco
Director, Terminal Services
Houston Fuel Oil Terminal Co.

Roger Guenther
Executive Director
Port Houston

Kirk Jackson
President
Suderman & Young Towing Co.

Tom Marian
General Counsel
Buffalo Marine Service, Inc.

Capt. Mark Mitchem
Presiding Officer
Houston Pilots

Joe Nassif
President
Odfjell Terminal (Houston) & Odfjell
USA

Chris Robblee
General Manager – Gulf Terminals
Vopak NA

Robert Sanders
Senior Vice President, Asset
Optimization
Enterprise Products Partners L.P.

John W. Schlosser
President
Kinder Morgan Terminals

Jamie Sylvester
Shareholder
Briggs and Veselka Co.

John Taylor
Secretary
Houston Mooring Company

A. James Teague
Chief Executive Officer
Enterprise Products Partners L.P.

Enclosure: White Paper: "Two-Way Vessel Movements on the Houston Ship Channel: Necessary for Safe Transits and Economic Growth"

CC: Edmond J. Russo, Jr., PhD, PE, D.CE, D.NE, D.WRE, edmond.j.russo@usace.army.mil

Greater Houston Port Bureau White Paper-G060518

Two-Way Vessel Movements on the Houston Ship Channel: Necessary for Safe Transits and Economic Growth



Photo Courtesy of Lou Vest



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Problem

The Houston Ship Channel is a nationally-impactful complex transportation and manufacturing system. The Section 216 study currently underway needs to fully consider the economic and safety implications of failing to improve the channel to handle expected demand. Two-way vessel traffic on the Houston Ship Channel is essential for safe and efficient commerce. As the port of Houston is the largest port in the U.S. by foreign tonnage, channel improvements – or lack of improvements – impact the entire nation, not just the surrounding region.

It appears that the Army Corps is not considering the correct and complete economic impact, operational factors, and pilots' safety rules regarding increasingly large vessels in determining the benefit-to-cost ratio of the project segments. Therefore, the Corps currently recommends widening only a small part of the critical Bay Reach as part of a federal project.

Although the Corps has forecasted that Houston will receive approximately four container ships over 1,100 feet long and larger ("1,100'+ LOA") per week by 2029, the negative impacts to vessel traffic have been ignored. Based on current channel dimensions, **each** of these vessels will cause the Houston Ship Channel to be partially closed two days per week while the vessels are transiting. This has a severe impact on other vessel traffic, especially for the numerous LPG and liquid bulk vessels, which are restricted to daylight-only movements. Furthermore, at least one major container line has indicated that it will schedule a 1,100'+ LOA vessel for Houston as soon as possible after the current Bayport Channel flare dredging project is completed at the end of summer 2018.

The Houston Pilots estimate that a single 1,100'+ LOA container vessel per week will cause 5,200

hours of delays per year. With the predicted vessel forecast, this leads to 20,600 vessel hours of delay each year, conservatively estimated at **a cost of over \$20 million per year on vessel day rates alone**. This does not include the economic impacts of lost opportunities for terminals, lost labor, trade, and more. Each arrival of one of these vessels will delay 34% of the other vessels in the channel, and each departure will delay 26% of other vessels.

Members of the Houston port region maritime industry offer the following evidence that the negative impacts of failing to sufficiently widen the Houston Ship Channel are severely underestimated by the Corps' current analysis.

Background

The Houston Ship Channel (HSC) and the port of Houston are core components of a complex logistics system. The area surrounding the port of Houston is the largest petrochemical manufacturing complex in the U.S. and second-largest in the world. The port of Houston is the largest U.S. port by foreign tonnage, the largest export port in the U.S., the largest container port in the U.S. Gulf of Mexico, and is part of the fourth-largest city in the U.S. A 2014 study by Martin Associates showed that the port of Houston's national economic impact is \$617 billion per year.

The entire Texas and Louisiana Gulf region is in a renaissance due to business derived from accessible shale hydrocarbons. A survey compiled by the American Association of Port Authorities in 2016 showed **\$128 billion in capital expenditures in Gulf ports** between 2016 and 2020 – 88% of the total capital expenditures for U.S. ports. Companies are investing in our ports. The HSC, a federal project, needs to keep pace with industry investment.

While the HSC is a narrow channel, two-way traffic with existing vessel sizes is nearly always possible. However, vessel sizes are increasing, particularly in the container and liquid bulk industries. The Houston Pilots have implemented a series of rules designed to prioritize safety for movements on the channel. Based on current channel dimensions, vessels over 1,100 feet in length will cause the Houston Ship Channel to be partially closed while those vessels are transiting. This has a severe impact on other vessel traffic critical for the national economy, especially liquid bulk and LPG vessels, which are restricted to daylight-only movements. These vessels represent over 60% of the ships that come to the port of Houston and secure the growing revenue from valuable U.S. exports

Furthermore, container volumes in Houston have grown consistently over the past several years, thanks in part to the expansion of the Panama Canal completed in 2016 and hundreds of millions of dollars invested in the Port Houston container terminals to ensure global competitiveness.

The Houston Ship Channel Expansion Channel Improvement Project (“216 study”) is evaluating improvements to six segments on the HSC, including widening through the Bay Reach. Of this Bay Reach segment, there are two sections leading to the two container terminal channels: Bolivar Roads to Redfish Island, and Redfish Island to Morgan’s Point.

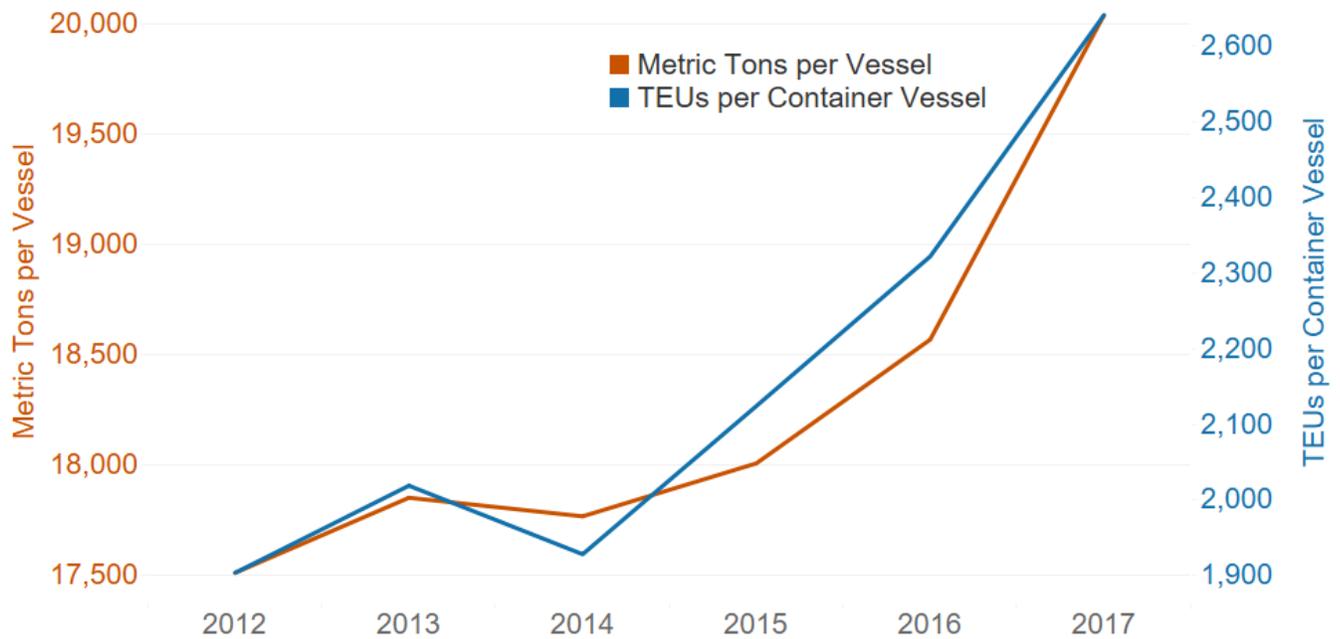


Figure 1: Port of Houston Growth in Tonnage and TEUs per Vessel 2012-2017. Sources: U.S. Census Bureau, Port of Houston Authority, Greater Houston Port Bureau Marine Exchange

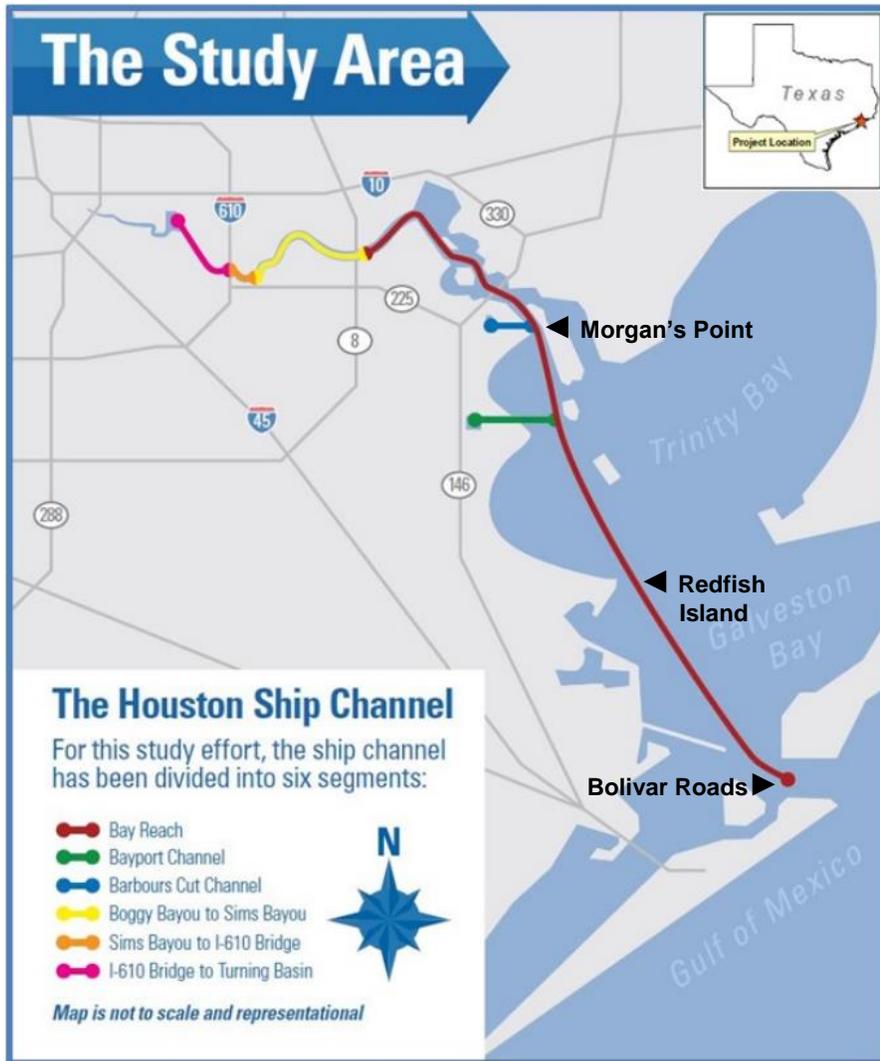


Figure 2:
Six Study Segments for the 216 Study. Originally published August 2017 in HSC ECIP DIFR-EIS. Location labels added by Greater Houston Port Bureau.

Based on the Corps' current analysis, the 216 study asserts that the benefit-to-cost ratio is too low to justify widening the section from Redfish Island to Morgan's Point. Therefore, the Corps currently supports a federal project recommendation to widen only a small part of the critical Bay Reach, which is akin to developing a "Road to Nowhere." Members

of industry request that the following information and scenarios be evaluated to provide more insight into the negative impacts of insufficiently widening the HSC.

Factors for growth considerations for the port of Houston

There are operational and economic factors that must be considered by the Corps. Some of these may not be fully accounted for in the current economic modeling.

1. Approximately 8,300 deep draft vessels call on the port of Houston each year. One hundred percent of these vessels transit above Redfish Island, and 93-95% of these vessels transit above the Bayport Channel.
2. Growing exports of petrochemicals and petroleum products have increased the number and size of tankers, and due to the heightened traffic and larger width, two-way traffic is essential to keep commerce flowing efficiently.
3. MSC, the second-largest container shipping company in the world, has expressed interest in bringing 14,000 TEU container vessels to Houston. These vessels are 1,200.8 feet in length and 168.0 feet in beam.
4. Based on preliminary Houston Pilots' simulations, 1,100'+ LOA container vessels cannot meet or overtake other vessels in the channel unless the channel is at least 700 feet

wide. However, the Houston Pilots strongly recommend a minimum width of 750', which adheres to the minimum design parameters specified in Corps' hydraulic design of deep-draft navigation projects manual (EM 1110-2-1613).

5. The transit from Bolivar Roads to Bayport or Barbours Cut container channels is about 3-3.5 hours.
6. According to the Corps' own forecast, about 216 1,100'+ LOA container vessels per year (about four per week) will transit to Houston by 2029. This will cause eight partial closures per week for the arrivals and departures of these vessels.
7. One hour of delay causes three hours of recovery.
8. A partial channel closure caused by a large container vessel transiting in the existing channel would last for three hours; therefore, the recovery time would be nine hours.
9. From November to March, the daylight transit window is limited to as little as 7 hours per day. These are also the same months that the Gulf region experiences marine fog, which can cause temporary complete closures of the channel.

Current and potential Houston Pilots rules for large vessels

The current and potential Houston Pilots safety rules appear to not have been fully accounted for in the current economic modeling. Specifically, the following existing working rule was not evaluated in the draft feasibility report:

“The following restriction applies for all container vessels with an LOA greater than 1100': No meeting any other ships in the ship channel above B-18.”

Since these vessels have not yet come to Houston, the Houston Pilots may determine that further, currently unknown rules must be created to maintain safety.

Scenarios

Current scenario: Container vessels under 1,100 feet in length and channel 530 feet wide

With these conditions, vessels are currently able to transit with two-way traffic, and there are no delays caused by partial channel closures. However, industry and economic factors are driving the need for expanding this waterway. Daylight restrictions apply to the entire Houston Ship Channel, which shortens the available time window during which daylight-restricted vessels are permitted to transit. Due to transit rules regarding combined beam and draft measurements, loaded Suezmax and Aframax tanker vessels are not permitted to meet in the channel.

This scenario will not be valid much longer. At least one major container line has indicated that it will schedule a 1,100'+ LOA vessel for Houston as soon as possible after the current Bayport Channel flare dredging project is completed at the end of summer 2018.

Recommended project scenario: Widened channel through Morgan's Point

With the channel widened through the Galveston Bay and to Morgan's Point, the large container vessels will be able to transit the channel with two-way traffic using maneuvers acceptable to the Houston Pilots. This will eliminate the need for partial channel closures for these vessels to transit under normal operating conditions.

Another benefit of widening the channel will be a relaxation of combined beam and draft restrictions, which currently prevent loaded Suezmax and Aframax vessels from meeting in the channel. This will benefit the liquid bulk terminals in the ship channel.

A third benefit is the elimination of daylight restrictions through Redfish Island. This will allow daylight restricted vessels to begin or end their transit about two hours before or after current restrictions.

These benefits are nationally, not just regionally, significant.

Worst-case scenario: No channel improvements and 1,100'+ LOA container vessels

The worst-case scenario is failing to widen the channel, or in other words, keeping the current channel dimensions while attempting to meet industry demand for larger vessels. The port of Houston will see three-hour partial closures during daylight hours every time a 1,100'+ LOA container vessel arrives at or leaves the port of Houston. Initial estimates by the Houston Pilots indicate this will cause **5,200 hours of delay per 1,100'+ vessel** each year (see Figures 3 and 4). The first real-world test of this scenario is expected this summer.

The Houston Pilots are currently running training simulations to evaluate transit options to mitigate potential delays. However, the Houston Pilots will only consider options that provide equivalent levels of safety to existing practices.



Figure 4: Delays from 1,100'+ LOA Container Vessel Departure. Source: Houston Pilots

Figure 3: Delays from 1,100'+ LOA Container Vessel Arrival. Source: Houston Pilots.



Industry Perspective: Enterprise Products Partners L.P.

In a typical year, Enterprise Products Partners' facilities on the Houston Ship Channel export 500 ships of 20 million metric tons of Liquefied Petroleum Gas (LPG) cargo and Natural Gas Liquids (NGL). All of these cargoes operate under daylight transit restrictions. The effect on crude oil ships at Enterprise Houston is also considerable. These docks serve 280 ships/year and move 130 million barrels of oil cargoes. The 12-month pattern reveals that 145 of Enterprise's crude oil ships would be constrained by a loss of channel transit opportunity. These ships provide critical infrastructure to Houston area refineries and interruption of these supplies for even a single day jeopardizes the refinery outputs. In total, approximately 650 LPG and crude oil ships per year at Enterprise will be affected by the future traffic changes.

Enterprise is the global leader for the export of LPG from two facilities in the port of Houston. These two Houston facilities export one-half of all LPG exports for the entire United States – quantities comparable to entire nations in the Middle East. Enterprise Houston and Morgan's Point export terminals are supplied by the largest storage and fractionation complex in the world, Mont Belvieu, which is the price setting center for North America and influences prices worldwide. Production and export of domestic NGLs, which include ethane, propane, butane, and natural gasoline, have been rising steadily for several years, and over next 5 years NGL production is forecasted to grow by another 50%. If the offtake of NGLs does not keep pace with production, it could slow down shale development as inventories build.

Industry Perspective: Intercontinental Terminals Company

Intercontinental Terminals Company (ITC) owns and operates two liquid bulk storage terminals in Deer Park and Pasadena on the Houston Ship Channel. As a result of strong growth, the combined capacity will soon reach close to 20 million barrels in close to 300 storage tanks. The terminals provide a vital link in the international trade of petroleum products and petrochemicals, especially for the growing exports. Together, the two terminals handle close to 1,000 ships and 5,000 barges per year with seven ship docks and 14 barge docks. ITC's customers are dependent on efficient and predictable transfers for their cargoes in Houston. Two-way transit through the Houston Ship Channel is essential for this to happen efficiently. Delays in ship-transit and therefore trade will not only hurt the Houston area, but the entire Texas region and the nation. Our industry needs viable two-way transit in the Houston Ship Channel.

“The Road to Nowhere” scenario: Channel widened only through Redfish Island and container vessels over 1,100 feet

While any channel widening is preferred over no widening, halting the widening project at Redfish Island will fail to address the traffic needs of the growing vessel sizes on the Houston Ship Channel. Redfish Island is about 8 miles south of Bayport Channel and 12.5 miles south of Morgan’s Point (Barbours Cut). Widening only from the Entrance Channel to Redfish Island does not provide sufficient channel improvements to eliminate partial channel closures.

However, this widening project benefits users of the HSC by eliminating the daylight restrictions through Redfish Island, allowing daylight restricted vessels to begin or end their transit about two hours before or after current restrictions. Additionally, in the widened reach only, Suezmax and Aframax vessels would be permitted to meet in the channel.

Best-case scenario: Channel widened to 900-1,200’ through Morgan’s Point

Based on contemporary federal studies by the Corps and Corps design manuals, the channel through Galveston Bay should be 900-1,200’ wide to enable safe navigation under a wide range of circumstances.

The width safely accommodates the extraordinary volume and expected size of vessels and incorporates risk mitigation for the high percentage of hazardous cargos carried by vessels calling at Houston. Additionally, a widened channel would allow for a greater safety margin during periods of restricted visibility.

Conclusion

The port of Houston is a key national asset. Improvements to the Houston Ship Channel should fully consider the impacts on the industries utilizing this major infrastructure project. Two-way vessel traffic is essential for ensuring a safe waterway and growth in commerce.

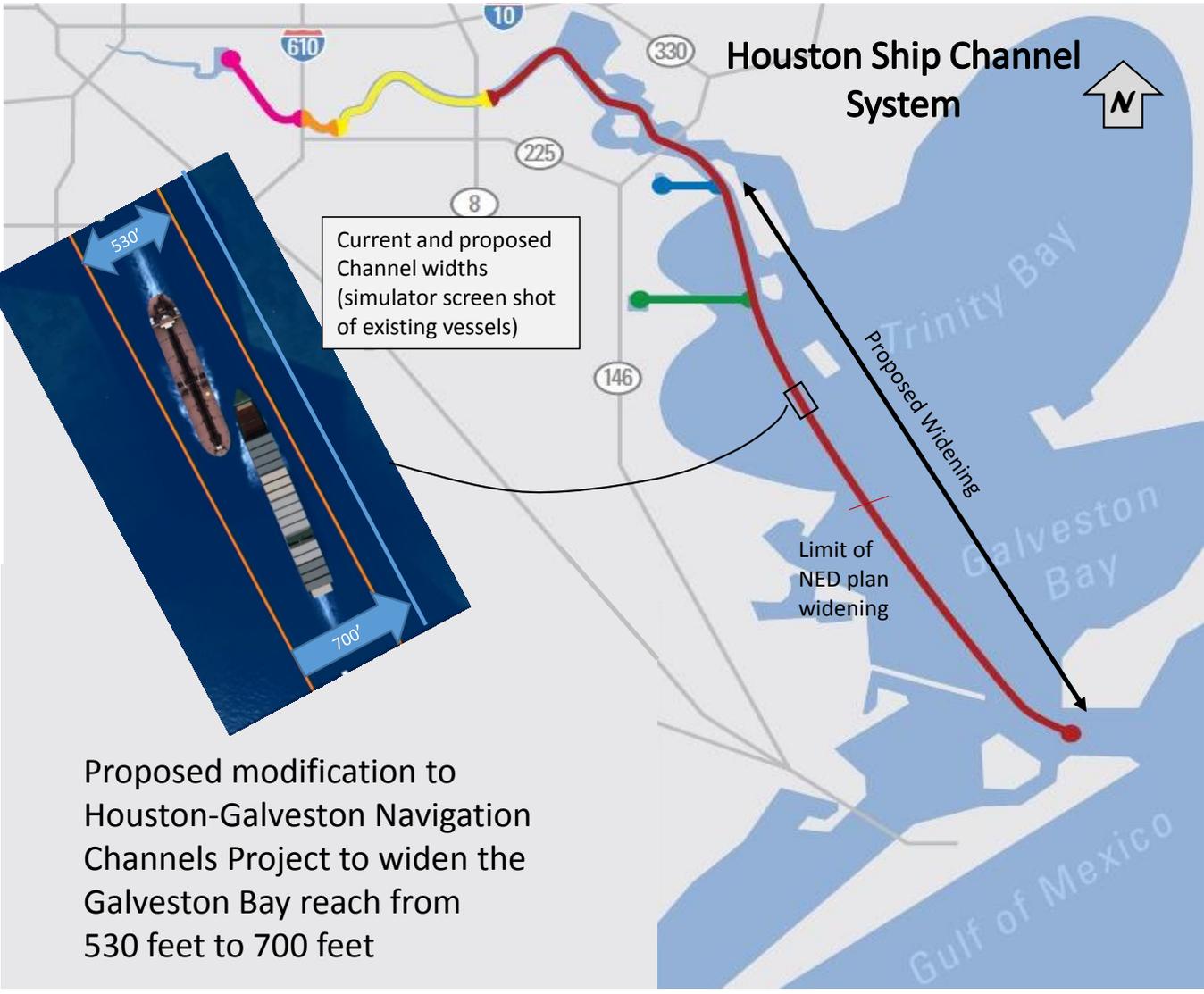
If you would like additional information or have questions, please email info@txgulf.org or call (713) 678-4300.



Map Document

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PHA 7001 mod HGNC widen channel .pdf



Houston Ship Channel System

Current and proposed Channel widths (simulator screen shot of existing vessels)

Proposed Widening

Limit of NED plan widening

Proposed modification to Houston-Galveston Navigation Channels Project to widen the Galveston Bay reach from 530 feet to 700 feet

