Houston Ship Channel – Expansion Channel Improvement Project
Non-Federal Sponsor's Perspectives and Position

EXECUTIVE SUMMARY

The Port of Houston Authority of Harris County, Texas (Port Houston) serves as the non-federal sponsor of the Houston Ship Channel. Port Houston and the U.S. Army Corps of Engineers (USACE or Corps) have had a successful partnership in building, maintaining, and growing this waterway for more than a century, to the significant benefit of the region, state, and nation.

Partnership and collaboration between Port Houston and the USACE have continued to be the hallmark during the study and development of the Houston Ship Channel – Expansion Channel Improvement Project (HSC-ECIP). However, there remain limitations in the federal process that negatively impact the potential national benefits of this project. Therefore, Port Houston respectfully submits its perspective on those issues as well as recommendations for addressing them.

SUMMARY OF NON-FEDERAL SPONSOR'S POSITION ON CORPS' POLICY

All Channel Segments Studied Qualify for the National Economic Development (NED) Plan – Virtually all vessels that call at the Port of Houston travel through the entire Galveston Bay reach of the Houston Ship Channel. As a result, throughout the feasibility study process, Port Houston has maintained that it was inappropriate to consider the channel improvements through Galveston Bay as three segments. Additionally, Port Houston believes that the federal economic evaluation process fails to account for the national economic and safety benefits of channel widening throughout the entire length of the Bay, which is arguably the highest demanded improvement by the employers and manufacturers at the Port of Houston.

Federal Maintenance of the Locally Built Components Provides National Benefits – Port Houston has committed to widening the channel with 100% non-federal funding for the upper two segments through Galveston Bay that were not justified for inclusion in the NED – known as the locally preferred plan (LPP). This commitment was necessary to meet deadlines for inclusion in the Water Resources Development Act (WRDA) legislation anticipated in 2020 and continue Port Houston's and private industry's collective effort to expedite the project's implementation to safely accommodate national economic benefits. The LPP is also critical for safety. From 2015 to 2019, 89% of the major vessel incidents occurred in the area where the federal process determined widening was not justified for federal participation, which threatens both economic and environmental impacts.

The limitations of the federal process would unfairly burden local entities at the Port of Houston and compel them to build and incur life cycle operation and maintenance costs for channel improvements that safely accommodate nationally significant and beneficial commerce in energy, manufacturing, exports, and jobs.

There is, therefore, a national economic justification for the federal government to assume the operations and maintenance responsibilities of the LPP components.

Nationally Significant Infrastructure for Economic Recovery

Infrastructure is Critical for Economic Recovery – The nation's port and maritime workers have continued operating as critical infrastructure workforce, providing much-needed supplies and products during the global COVID-19 pandemic.

As the U.S. emerges from today's crisis, it will be critical to have the necessary infrastructure in place to facilitate economic recovery and get people back to work. It is important to ensure that the Houston Ship Channel, the busiest U.S. waterway and home to the largest exporting region in the nation, is widened and deepened to safely and efficiently accommodate the diverse commerce at the Port of Houston and facilitate recovery.

PORT OF HOUSTON OVERVIEW

Economic Impact - The greater Port of Houston includes eight public and nearly 200 private terminals. The activity at these facilities results in the significant economic impact each year.

	United States	Texas
Jobs Sustained	3 million	1.35 million
Economic Value	$802 Billion	$339 Billion
Tax Revenues	$38 Billion	$6 Billion

Economic Recovery and Growth – The Port of Houston is the epicenter of dynamic national and global growth:

- ***Panama Canal and Vessel Size*** – New supply chains are growing from an expanded Panama Canal and larger vessel sizes (the new Panamax-size vessel is 25% longer, 50% wider, and 27% deeper).
- ***Petrochemical Manufacturing*** – More than 300 projects and $200 billion in petrochemical manufacturing investments in Texas and Gulf Coast were spurred by natural gas prices and growing demand overseas.
- ***Exports*** – With domestic energy production and growing demand overseas, increasing energy exports provide an estimated $44.8 billion incremental positive balance of trade benefit to the U.S.

Port of Houston National Rankings

- #1 – Foreign-Waterborne Tonnage (1 of every 8 tons in the nation)
- #1 – Total U.S. Exports
- #1 – U.S. Gulf Container Port
  (96% of Texas and 70% of Gulf waterborne containerized cargo)
- #1 – U.S. Energy Port
- #1 – Steel and Project Cargo
- Largest petrochemical manufacturing complex in the U.S.

Busiest U.S. Waterway

Annually - The Houston Ship Channel is home to roughly 9,000 ship calls each year, which translates to more than 20,000 ship movements, plus more than 200,000 barge movements. This is nearly equal to the next three busiest port combined – *Long Beach, Los Angeles, and New York/New Jersey*.

Daily – In any given day, there are 60 deep-water ship arrivals and departures, 80 ships in port, and 400 vessels of all kinds.

Safety

A wider channel is a safer channel. For its volume of traffic and the size of the existing fleet currently using the waterway, Houston's is the narrowest channel in the nation.

- From 2015 to 2019, 89% of the major vessel incidents have occurred in the area where the federal process determined widening was not justified for federal participation.

CONCLUSION

Without full widening to accommodate the increasing vessel sizes and growing traffic, the channel will become a one-way and daylight-restricted waterway, jeopardizing safety and future economic benefits as we recover from today's headwinds.

Expanding the channel increases the safety and efficiency of the two-way traffic on the busiest U.S. waterway, sustaining national energy security, domestic manufacturing growth, thriving U.S. exports, and expanding job opportunities.

Based on the information and data presented herein, there is a national economic justification for the federal government to assume the ongoing operations and maintenance responsibilities of the locally-built (LPP) components.

Section 1. NATIONAL IMPORTANCE

The collaboration between Port Houston and the USACE over the last century has brought great benefits to the nation. Houston is unique among major U.S. port cities – it was not home to a natural harbor and had no early history as a port for ocean-going vessels. Instead, the man-made Houston Ship Channel transformed a shallow bay, river, and bayou into the nation's largest port complex for international trade. What began as an innovative, pioneering, 50/50 cost-sharing agreement between local citizens and the federal government, culminating in 1914 as Houston's first deep-water channel, has today resulted in a world-class port, sustaining millions of jobs across the United States, generating billions in economic value, and serving as the top exporting region in the nation.

Over the last ten years, Port Houston has once again partnered with the USACE to develop the next major improvement to the Houston Ship Channel: the Houston Ship Channel Expansion Channel Improvement Project (HSC-ECIP).

This project comes at a time when the nation is at another historic crossroads: the United States is positioned for a future as the largest energy provider in the world and a net energy exporter as well. New energy production techniques, along with federal policy changes, have unlocked the potential to provide the world with American energy, expand domestic petrochemical manufacturing, and generate tremendous economic value for the country. But the necessary infrastructure must be in place, both to move past the current economic headwinds and fully realize these future benefits – and a key component of that infrastructure is the Houston Ship Channel, which serves a crucial role in this essential supply chain.

Expediting the completion of the expanded Houston Ship Channel project is the critical first step to realizing these benefits.

- In the few years since the federal government authorized crude oil exports, Houston has become the nation's top crude-oil exporting region, shipping nearly 2.5 million barrels per day. Moreover, port-side infrastructure is in place and future investment is planned to support further growth in crude production in the most active regions in the nation, including the Permian Basin, Eagle Ford, and Bakken, and future export growth as well.

- Just as significantly, the Port of Houston is home to the largest petrochemical manufacturing complex in the United States, the nation's top project and break-bulk terminals, and more than half of the container shipping in the Gulf of Mexico region.

Houston is the largest exporting port in the nation.

Port Houston is submitting this Non-Federal Sponsor Position document to address limitations in the federal water resource project development and justification processes. The processes have not considered critical project benefits beyond transportation cost savings, are based on subjective incremental element analysis of necessary project improvements, have added culture-driven inflated costs, and do not sufficiently model and address the safety risks of a limited project.

The information in this addendum will clearly demonstrate the national interest in adoption of the following additions to the Houston Ship Channel expansion project:

- Widening of the entire reach of the Houston Ship Channel through Galveston Bay (segments 1A, 1B, and 1C) into the National Economic Development (NED) plan for the project.
- Federal assumption of maintenance (AOM) of the Locally Preferred Plan (LPP) – widening segments 1B and 1C – regardless of the NED.

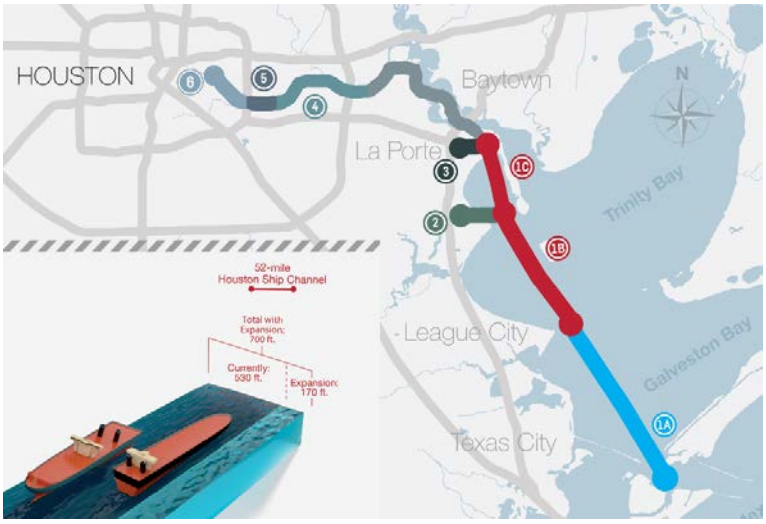
1.1. Port of Houston National Impact

The 200-plus public and private facilities that comprise the greater Port of Houston provide significant benefits to Texas and to the nation:

Annual Economic Impact:

- ***Texas*** – sustains 1.35 million jobs in the state, provides $339 billion in economic value, and generates $5.6 billion in state and local tax revenue.
- ***United States*** – sustains 3 million jobs nationally, provides $802 billion in economic value, and generates $38 billion in total tax revenue.

Busiest U.S. Waterway:



- The Houston Ship Channel is the busiest deep-draft waterway in the country, annually welcoming nearly 9,000 ship arrivals, which generate 20,000-plus vessel movements within the Port of Houston each year.
- This is in addition to approximately 200,000 annual barge movements within the port.
- In any given day, there are 60 deep-water ship arrivals and departures, 80 ships in port, and 400 vessels of all kinds.
- Putting this into national perspective, each year deep-draft vessel activity at the Port of Houston is nearly equal to the combined totals for the next three busiest ports – Los Angeles, Long Beach, and New York/New Jersey, according to United States Maritime Administration data.

National Rankings:

- #1 port in United States for foreign-borne tonnage: 1 of every 8 tons of international cargo in the nation moves through the Port of Houston.
- #2 for total tonnage, handling more than 201 million tons in 2018.
- #1 United States port for energy, steel, project cargo, and largest container port in the U.S. Gulf.

Exports:

- The greater Port of Houston is the nation's leading gateway for exports, handling $89.9 billion in 2019, helping to keep Texas the largest exporting state.
- This total represents 5.4% of our country's exports (valued at $1.6718 trillion in 2018).

Growth:

- Hydrocarbon exports on the Houston Ship Channel are projected to double by 2025, growing from $93 billion to $218 billion in value.
- In 2018, international waterborne cargo at the Port of Houston grew at more than twice the pace of the nation's growth, adding 17.5 million metric tons that year.
- The size of vessels in the worldwide fleet continues to grow, serving efficiency and the environment, as larger vessels carry cargo at the lowest cost with the lowest emissions. The expansion of the Panama Canal recognized these changes.
- With expansion of the canal and changes in the world's fleet, larger vessels – tankers and container ships – must call the Port of Houston.

1.2. Houston Ship Channel Industry Demand and Commitment

The Houston Ship Channel is the foundation for the national economic benefits provided by the Port of Houston and the 200-plus entities that comprise it. Because of the tremendous growth of energy products and petrochemical manufacturing, and at the same time the global trend of increasing vessel sizes, maintaining safe and efficient two-way vessel traffic on the Houston Ship Channel now and into the future is a top priority of these businesses that depend on the port. This in turn drives the urgent demand for channel widening.

Yet the modeling used by the USACE for project justification assigns neither safety nor economic value to channel widening, ignoring the most important factors driving the need for the improvements demanded by the energy and maritime industries.

While the Port of Houston is experiencing major growth in exports of petroleum and petroleum products, including liquified petroleum gas (LPG), its container trade is also growing

Houston is the energy capital of the world.
We have oil. We have natural gas.
We have natural gas liquids. We have refining.
We have petrochemicals.
We have pipelines. We have docks.
And, last but not least, we have the Houston Ship Channel.
In many respects, the Houston Ship Channel is
now just as important as the Strait of Hormuz."

Jim Teague, CEO/President
Enterprise Products Partners

rapidly, as new resin manufacturing facilities in the area come on line and begin to export most of their products in containers.

Unless the Houston Ship Channel is widened from Bolivar Roads to Barbours Cut, this additional vessel traffic from tankers and containerships will cause increasing congestion and increased shipping costs.

Because half a trillion dollars in existing pipeline, refining, and petrochemical infrastructure connects to the Houston Ship Channel and billions more are coming in investments, there are no alternatives to this critical waterway in terms of United States energy security, exports, and manufacturing.

Section 2. PORT HOUSTON COMMITMENTS

Port Houston is deeply committed to expeditious completion of the HSC-ECIP project and full Galveston Bay widening. Port Houston Chairman Ric Campo summed it up last year:

> *We have to have two-way traffic… period… end of story… Imports and exports are going to increase and if we don't deepen and widen the channel, we'll have a logjam. That logjam will reach all the way up back through the supply chains and increase consumer prices for everything.* [1]

Port Houston is at work to fund the entire cost of new construction in conjunction with our local partners.

Ownership and control of maritime facilities in the greater Port of Houston complex is split between the eight publicly-owned Port Houston facilities and the approximately 200 privately-owned and operated terminals. Private industry represents the majority of port traffic in terms of cargo volume, vessel counts, and the tally of deep draft docks for ocean-going vessels.

Industry is helping lead the way in advocacy for this project, with its primary focus on ensuring two-way traffic throughout the bay portion of the Houston Ship Channel. Industry views one-way traffic on the channel as in conflict with the need to export an ever-growing volume of U.S.-produced hydrocarbons through the channel. For example, in an April 2019 press release on a related issue, industry said they supported the necessary capital investments and improvements to maintain the dynamic two-way traffic that has allowed all types of businesses to thrive on the Houston Ship Channel for over a century. Industry expects to invest in and support the critical efforts to widen the Houston Ship Channel for the benefit of all.[2]

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[1] *Houston Chronicle*, Port of Houston steps up game to build support for $1 billion expansion project, Sergio Chapa, Sep 13, 2019, https://www.houstonchronicle.com/business/article/Port-of-Houston-steps-up-game-to-build-support-14436072.php#photo-17843026

[2] *Business Wire*, Statement of Texas Energy Leaders about Port of Houston Legislation, April 24, 2019 https://www.businesswire.com/news/home/20190424005896/en/Statement-Texas-Energy-Leaders-Port-Houston-Legislation

Industry's concerns with one-way traffic in the bay helps explain its support for the LPP and opposition to the NED plan, which is projected to require one-way traffic in the mid bay reach.

- While one-way traffic produced minimal costs inside the USACE HarborSym modeling environment, industry's reaction to one-way traffic protocols in Galveston Bay put in place by the Houston Pilots in 2018 to 2019 clearly shows that the USACE NED modeling process failed to capture the real National Economic Development impacts of one way traffic.

Industry groups are at work on the project:

- The "Big Ten", joint meetings among Port Houston, the Houston Pilots, and the largest Houston Ship Channel private users: LBC, Enterprise Products, ExxonMobil, HFOTCO/SemGroup/ETP, Intercontinental Terminals Company (ITC). Kinder Morgan, Kirby, Magellan, Odfjell, Shell, Targa Resources, and Vopak.

- Industry's own advocacy organization, the Coalition for a Fair and Open Port: Anadarko Petroleum Corporation, Apache Corporation, ConocoPhillips Company, Enterprise Houston Ship Channel LP., EOG Resources, Inc., Intercontinental Terminals LLC, Kinder Morgan Inc., Magellan Midstream Partners, L.P., SemGroup Corporation, Targa Resources Corporation, and Vopak North America Inc.

- The Houston Pilots, who are responsible for safely navigating deep-water vessels in, out, and around the Port of Houston, and have to contend with an overly narrow bay reach channel as they navigate vessels in and out of the port every day.

Industry will reap direct benefits from the channel improvements, including both the full bay widening as well as uncontested improvements further up the channel. The *Houston Chronicle* provided the following profile of one such firm that will benefit from the widening:

> *[Port Houston Chairman Ric] Campo and the port have found a strong ally in Jim Teague, CEO of the Houston pipeline and export terminal operator Enterprise Products Partners. With several processing facilities and export terminals in the Houston area, Enterprise is ranked as the largest U.S. exporter of crude oil and natural gas liquids such as ethane, propane, butane and pentane. The company closed 2018 with a $4.2 billion profit on $36.5 billion of revenue.*
>
> *With traffic of vessels hauling liquefied petroleum gas products such as propane or butane* [currently] *restricted to daylight hours, Teague believes widening and deepening the channel will allow for an additional three or four LPG ships per day. It will also provide an outlet for growing production of crude oil and natural gas liquids in the Permian Basin and other U.S. shale plays, he said.*
>
> *"We've got a wide net to accommodate what's coming out of the Permian Basin, what's coming out of the Eagle Ford* [Shale] *and what's coming out of the DJ Basin* [in Colorado, Wyoming, and Nebraska]," *Teague said. "Everything's funneled to*

Houston. There's a reason why Exxon and Chevron want their crude out of the Permian to come to Houston — because it's a market."[3]

Private industry has indicated a willingness to provide assistance in funding the construction of the HSC-ECIP, and the final funding agreement will be shared with Congress and the Administration. However, considering the many issues and persuasive reasons discussed in this report, both Port Houston and industry urge the Federal government to assume the maintenance for this project.

Section 3. ALTERNATIVE EVALUATION OF PROJECT COSTS AND BENEFITS

Since the announcement of the tentatively selected plan, Port Houston has expressed significant concerns regarding the USACE process and its limited interpretation of the project's benefits and costs. Specifically, Port Houston believes that the USACE's calculations undervalue benefits and overstate costs, with a negative impact on the project's benefit-to-cost ratio (BCR).

Initially, these concerns compelled Port Houston to take the significant measure of requesting a categorical exemption from the Assistant Secretary of the Army (Civil Works) to include widening the entire stretch of the channel through Galveston Bay. The request was subsequently denied, and in the interest of time and economic cost to the nation, Port Houston committed to building the Locally Preferred Plan (LPP) to fully widen the bay reach. Unfortunately, the same issues remain, and seem to have been exacerbated during subsequent USACE review.

Accordingly, this section highlights Port Houston's specific concerns and uses appropriate, real-world, and nationally significant data to urge that portions of the LPP be included in the NED, or at the very least that long-term federal maintenance of the entire project be adopted.

3.1. AECOM Report

To address the undervalued benefits and overestimated costs, Port Houston retained AECOM, a national engineering firm with substantial experience in navigation projects. The firm has independently reviewed and updated the widening economic analysis inside a NED-compliant framework and the same HarborSym model as used by the USACE. AECOM's report, *Houston Ship Channel Expansion Channel Improvement Project, Harris, Chambers and Galveston Counties, Texas: Review and Update to the Widening Economic Analysis on behalf of the Port of Houston Authority*, is based entirely on the USACE's "July 2019 Draft HSC-ECIP Feasibility Report," with select revisions focused on *using more current data from the same government data sources*. This report:

- Uses the same HarborSym node network as the USACE report and uses variable values that were provided to AECOM by USACE team members.
- Considers NED-compliant safety benefits.[4]

[3] Ibid.

[4] Since the 2015 start of the USACE feasibility study, there have been nine ship/ship or ship/barge collisions in the Houston Ship Channel. 89% (i.e. 8 of 9) have occurred in the bay reach of the channel, where the NED proposes no improvements.

- Limits material modifications to previously established inputs:
    - Inputs were adjusted only where there was significant divergence between the USACE input value and data collected by Port Houston.

The details of these conservative, fact-based changes to the USACE report are described below. Based on these enhanced HarborSym simulations, the report significantly concludes:

> *[T]he project alternative with the greatest net NED benefits should be included in the NED plan and recommended by USACE to Congress – full Galveston Bay widening.*
>
> ***This Report underscores that the USACE should include both construction and maintenance of a fully-widened Galveston Bay reach in the plan it recommends to Congress.***

The result of this analysis is a compelling demonstration that the LPP should be the Recommended Plan for authorization in WRDA. Moreover, the AECOM findings hold true even if safety benefits are not considered.

3.1.1. Benefits

Port Houston strongly believes the benefits calculated in the USACE economics study substantially underestimates the true benefits of widening. Four key circumstances led to this conclusion, and drove cargo and vessel fleet assumptions updates from those used in the USACE study, and which in turn directly flowed through to the benefits calculated by AECOM using the HarborSym Model:

1. The USACE report considered Gulf Coast growth in its entirety and did not break out the unique growth situation of the Port of Houston.

2. The Houston Ship Channel is currently undergoing a huge transition in commodity flows and vessel traffic, emerging as the nation's leading waterway for the export of liquified petroleum gas (LPG), crude oil, and petrochemical products. At the same time, there is significant growth in the size of container vessels that seek to transit the Houston Ship Channel, a development shared with all other major global container ports. Both factors are contributing to a rapid increase in the size of vessels transiting and seeking to transit the Houston Ship Channel, but the USACE study does not capture the magnitude of this American export success story.

3. The export container trade is also growing rapidly at the Port of Houston, with the recent completion of several new plastics manufacturing plants in the Gulf Coast region, affiliated with ExxonMobil Chemical Company, Chevron Phillips Chemical Company, and others. Most of the resin products of these facilities are being exported in containers, with the result that during both 2018- and 2019-to-date, Port Houston container terminals have led major U.S. container ports in export growth. Unfortunately, neither this growth in container volume nor concomitant vessel size increases were considered in the USACE study.

4. Moreover, unless the Galveston Bay reach of the Houston Ship Channel is widened, the ongoing increase in tanker and container ship traffic can be expected to contribute to congestion and high shipping costs. Because it does not appropriately account for the new vessel traffic, the USACE economics modeling does not calculate the widening benefits (including cost avoidance) related to congestion relief in the channel; rather, its model studies a channel with unrealistically smaller vessels.

Because of these circumstances, it is essential that the USACE Economics model be updated. Accordingly, the AECOM report uses a vessel fleet forecast based on more current data, and included an estimate of safety benefits as well (while the latter is permitted in the NED framework, the USACE typically declines to address safety benefits because of the difficulty of gauging their effects). The AECOM report also considers additional container vessel traffic, based on updated data and particularly considering the impact of new resin manufacturing facilities.

AAEQ Benefits and Costs ($1,000, 2019 Price Level, 2.875% Discount Rate)

	AAEQ Benefits & Costs
Transportation Cost Savings	$32,089
Safety Benefits	$13,832
Total Widening Benefits	**$45,921**
Net Costs of Channel Widening (USACE-identified NED plan with full Bay widening minus USACE-identified NED plan without full widening)	**$12,445**
Net Benefits	**$33,476**
Benefit Cost Ratio (BCR)	**3.7**
Benefit Cost Ratio (BCR) without Safety benefits	**2.6**

The complete details of the changes can be found in the full text of the AECOM report. These updates to the benefits calculations, when combined with the updates to the cost calculation described below, directly contributed to AECOM's findings in favor of the full bay widening.

Another factor increasing benefits will be the accelerated project schedule. Port Houston seeks to directly contract for the new construction dredging and associated tasks, which with local financing will facilitate a major acceleration of the schedule, with the opportunity to complete components in 2024 instead of the estimated 2030 end date. This six-year acceleration should result in realizing project benefits earlier in time and with lower costs. Contracting efficiencies associated with locally-based procurement and approval processes, and more flexible scope options, may result in savings as well.

3.1.2. Costs

The USACE Cost Engineering Center of Expertise (MCX) in Walla Walla, Washington produced Cost and Schedule Risk Analysis (CSRA) reports for both the LPP and the USACE's "NED" plan.

These have been certified, and the Mii (Micro-computer Aided Cost Estimated System Second Generation) output has been certified as well.

However, Port Houston believes that these project cost estimates, which total $877 million, are unrealistically high. Through a combination of what Port Houston believes to be more realistic cost calculations based on past experience, coupled with a compressed construction schedule, and the other cost savings measures described below, Port Houston has concluded that the appropriate project cost estimate for use in the model is $826 million which is significantly lower than the USACE cost estimate.

Port Houston continues to believe these CSRA and Mii cost calculations should be reduced:

- The resulting contingencies included in the report are unrealistically high; and
- Port Houston expects to generate significant construction cost savings through directly contracting the work and completing it over a shorter construction timeline.

Regarding the first bullet: Port Houston firmly believes – with support from the Houston Pilots – that a more realistic cost contingency is calculated per segment, reflected in the following table:

Port Houston's Proposed Contingences for HSC-ECIP

Segment	Contingency Percentage	Contingency Costs	Total Costs
1A	20%	$17,189,000	$104,816,000
1B	29%	$33,993,000	$151,338,000
1C	23%	$22,479,000	$121,173,000
2	26%	$16,588,000	$79,535,000
3	23%	$24,739,000	$133,324,000
4	17%	$27,474,000	$188,927,000
5	21%	$967,000	$5,514,000
6	18%	$6,378,000	$40,934,000
Totals	**22%**	**$149,807,000**	**$825,560,000**

This results in an average contingency of 22%. Reducing the contingency to this more realistic level is the source of the $51 million savings discussed above.

Regarding the second bullet: Port Houston may directly contract dredging work to better accommodate local industry's rapid growth, made possible with full local funding. As an example of savings already in place from this approach, project engineering and design (PED phase) work is being carried out by Port Houston at a total cost of less than $40 million, versus USACE's cost estimate of $66 million.

3.2. Third-Party Economic Studies

Port Houston has also commissioned or collected four separate third-party economic studies:

- Martin Associates Economic Impact Study (2018)

- Perryman Group Port of Houston Oil and Gas Impact Study (2019)
- Rockler Channel Closure Study (2019), and
- Martin Associates Channel Widening Impact Study (2019).

These studies each use their own methodologies, and each demonstrate in their own way why it is essential to widen the Houston Ship Channel. However, unlike the AECOM study, these were not intended to be directly evaluated within the NED framework.

3.2.1 Martin Associates: Economic Impact Study (2018)[5]

These combined reports, written by leading maritime industry consultant John Martin, are based on a custom impact framework based around high-quality telephone interviews with businesses along the Houston Ship Channel. Rather than directly measuring the impact of channel widening, the Martin Associates' Economic Impact Study showcases the direct, induced, and indirect importance of the greater Port of Houston to the region, the state, and the nation across several dimensions:

Greater Port of Houston Jobs Impact (2018)

Impacts	Texas	Other States	Nationwide	Comments
Direct	67,039	0	**67,039**	Direct jobs are generated by activities at the Port of Houston
Induced	102,882	24,117	**126,999**	Induced jobs are supported by holders of direct jobs spending their paychecks
Indirect	55,103	9,180	**64,283**	Indirect jobs are supported by Port of Houston-dependent firms spending money in the economy
Subtotal	225,024	33,297	**258,321**	Direct, Induced, and Indirect jobs would disappear without the Port of Houston
Related	1,125,671	1,824,817	**2,950,488**	Related User impacts come from firms that make goods that are exported through the Port of Houston and consume goods that are imported through the Port of Houston
Total	**1,350,695**	**1,858,114**	**3,208,809**	Many of these jobs would disappear without the Port of Houston (others would remain, as cargo flowed to other U.S. ports)

- Jobs Impact: The study highlights the tremendous nationwide jobs impact of the Port of Houston. Direct jobs are the most impactful element of this category, with 67,000 tangible, real jobs in the Greater Houston area generated by the Port of Houston; however, its induced and indirect impacts raise the nation-wide job total to over 258,000.

[5] The full title of these reports are *The 2018 Economic Impact of Marine Cargo Activity at the Port of Houston on the State of Texas and the United States,* and *The Local and Regional Economic Impacts of the Port of Houston, 2018.*

- "Related User" Impacts: These impacts are very large, representing over ten times the jobs impact of the direct, induced and indirect impacts. Related jobs are jobs involved in the production and consumption of goods that flow through the port.[6]

- Personal Income: The direct jobs above result in income or wages of $4.7 billion per year, while all levels of jobs impacts result in $170 billion in wages nationwide.

The study calculates that the greater Port of Houston results in a total economic value of $801 billion per year across the nation, flowing from direct business revenue, re-spending and local personal consumption, and related output – businesses making products for export and consuming imported products that move through the Port of Houston.

3.2.2 Perryman Group: Port of Houston Oil and Gas Impact Study (2019)[7]

This study was written by Ray Perryman of The Perryman Group, and used the firm's custom U.S. Multi-Regional Impact Assessment System. It directly measures the impact of channel widening in relation to petroleum-related exports, as well as containing modules analyzing several elements of the economy impact of the oil and gas industry in Texas. The most relevant are "Balance of Trade Effects of Increased Oil and Gas Exports" (pp. 31 *et seq*.) and "Oil and Gas and the Port of Houston" (pp 33. *et seq*.).

The former discusses the economic impact of channel widening, referring to "expanded infrastructure and port access," implicitly incorporating channel widening. These improvements are stated to be essential to increasing oil and gas exports through the Port of Houston, with a major impact on the U.S. balance of trade from reducing the trade deficit shown below:

Annual Balance of Trade Improvement (as of 2025)

$12.6 billion	Without development of needed infrastructure and insufficient access
$57.5 billion	Assuming adequate infrastructure and port access
+$44.8 billion	Incremental balance of trade benefits

Dr. Perryman concludes that widening the channel is an essential aspect to unlocking $44 billion of incremental oil and gas exports.

3.2.3 Rockler: Channel Closure Study 2019[8]

The third study was written by Nicolas Rockler of Kavet, Rockler & Associates, and is based on IMPLAN analysis informed by Port of Houston vessel moves data and 2012 Commodity Flow Survey data. This study does not directly measure the impact of channel widening. Instead, it

[6] Dr. Martin cautions that "the degree of dependence [of related jobs] on the port is difficult to estimate and should not be considered as dependent on the port as are the direct, induced and indirect jobs" (page 4).
[7] The full title of this report is *Economic Benefits of the Oil and Gas Industry for Texas and the Houston Area.*
[8] The full title of this report is *Economic Consequences of a Temporary Closure of the Houston Ship Channel.*

estimates the economic costs of a closure of the ship channel based on IMPLAN analysis of the dollar value of cargo handled on it.

- If the entire channel were closed, approximately $8.5 million per day of value of services would not be produced, based on IMPLAN data and Port of Houston vessel traffic information.

- The total economic consequences of such closure would be $17.8 million statewide per day, based on further IMPLAN analysis.

According to this model, a 10-day total channel closure would cause almost $180 million in statewide impact, and taking the argument further, a two-month closure could cause over $1 billion in statewide losses[9].

This study appears to be conservative in its approach and could be expanded by building a more detailed model of the reaction of facilities and other firms to a closure, i.e. by modeling inventories and production processes directly.

3.2.4 Martin Associates: Channel Widening Impact Study (2019)[10]

The fourth study, also written by leading industry consultant John Martin, incorporated two distinct elements:

- Scope One, to "Quantify the 2018 Economic Impacts of the Port of Houston by U.S. County," included two tasks:
    - Task 1: Identify Current Flows of Petroleum, Crude and Chemical Products throughout the U.S. and Estimate the Economic Impact by County
    - Task 2: Identify Current Flows of Containerized Cargo Throughout the U.S. and Estimate the Economic Impact by County

- Scope Two addressed "Expansion of the Economic Benefits Metrics to Demonstrate the Economic Benefits of Widening the Houston Ship Channel to the State of Texas" with four tasks:
    - Task 1: Evaluate Current Vessel Size Constraints Imposed by the Current Width and Depth of the Ship Channel
    - Task 2: Identify the Flow of Asian Containerized Cargo Between the Port of Houston and Texas Counties, as well as via the Competing Ports West Coast and South Atlantic Ports and Texas Counties
    - Task 3: Develop Logistics Costs and Identify the Cost-Effective Hinterland
    - Task 4: Estimate Benefits of the Widening Project for Containerized Cargo

[9] This value may overstate the harm; while firms would be expected to act to minimize impacts, their ability to do so is unknown.
[10] The full title for this report is *Economic Benefits Analysis to Support the Widening of the Houston Ship Channel – Draft*.

The report directly measures the impact of channel widening in Scope 2 Task 4, as summarized in the table below:

Calculated Benefits of Widening the Houston Ship Channel

Discount Rate	Benefits	Time Period
7%	$6.3 billion	Total benefits
	$457.0 million	Annualized benefits
3%	$13.2 billion	Total benefits
	$511.5 million	Annualized benefits

The dollar value of the benefits depends on the discount rate used to adjust future benefits to present values, ranging from at least $6.3 billion, based on a conservative 7% discount rate, to as high as $13.2 billion, based on a 3% discount rate.

Benefits of widening were projected based on removing size restrictions on container vessels transiting the Houston Ship Channel. With widening and the retaining of "All-Water East Asia" cargo routing to the Port of Houston, the benefits accrue to the following categories:

- Environmental Impacts
- Safety
- External Truck Cost Savings
- Logistics Cost Savings/Economic Competitiveness

The key research assumption was that unless vessel length restrictions were lifted, Port Houston can be expected to lose the "All-Water East Asia" trade to IPI/MLB (Inland Port Intact/Mini Land-Bridge) routing, i.e. the routing of inbound East Asia container traffic destined for Texas via Southern California ports and intermodal rail.[11]

3.3 Summary

These reports establish just how critical it is to complete a full bay widening as part of the Houston Ship Channel improvement project. It is essential to nationally-critical petrochemical and retail industries, including well-known firms such as Exxon and Walmart, as well as numerous businesses benefiting from the growth of shale oil production and exports.

4. CONCLUSION

Despite the immense national benefits to the nation, USACE processes generate results seemingly biased against widening the Houston Ship Channel, underestimating its benefits and overstating project costs, with the anomalous result of a low BCR for the locally preferred plan, while, as demonstrated above, full bay widening is critical for the nation.

[11] This report also breaks down Dr. Martin's prior 2019 Port of Houston Economic Impact by U.S. County and Texas Congressional District, based on PIERS data, TranSearch data, pipeline data, and other sources.

On the benefits side, HarborSym penalizes widening projects, even when essential to a port functioning such as the Port of Houston does. The HarborSym model is based on round trip cost economics, optimized for East Coast/West Coast ports with easy access to the ocean, and widening the Houston Ship Channel to relieve in-bay congestion is fundamentally disadvantaged by this bias. Perhaps it can be explained by the circumstance that no other major U.S. port as successful as the Port of Houston is dependent on a narrow bay channel. Nevertheless, it should be addressed, and happily the AECOM study derived positive benefits even from within the restrictions of the USACE process.

On the cost side, cost estimates appear to be far too high for this project, a function of overly-conservative contingency estimates, and ignoring the savings that should accrue from accelerating construction from 2030 to 2024.

Most significantly, Port Houston and its local partners have committed to directly fund the construction of the channel widening. Port Houston asks that the federal government assume maintenance for the entire project. Inclusion of this in WRDA 2020 serves the same goals as Port Houston's support of the LPP – to avoid the major economic consequences and the harm to future growth of U.S. exports and national economic development that will otherwise result.

- ***Without full widening to accommodate the increasing vessel sizes and growing traffic, the channel will become a one-way and daylight-restricted waterway, jeopardizing safety and future economic benefits as we recover from today's headwinds.***

- ***Expanding the channel increases the safety and efficiency of the two-way traffic on the busiest U.S. waterway, sustaining national energy security, domestic manufacturing growth, thriving U.S. exports, and expanding job opportunities.***

ATTACHMENTS

1. 2019 AECOM Report